

REPULIC OF THE SUDAN

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REPORT

OF THE



MEDICAL SERVICES, MINISTRY

OF HEALTH

FOR THE YEAR

1962-1963

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CHAPTER 1

INTRODUCTION

Equatoria Province recorded the highest rainfall over all Provinces and over the whole the year recorded an above average rainy season and consequently no shortage of grain.

Epidemic Diseases

95 Small Pox cases were recorded and were all from Blue Nile Province (94 from Roseires and Kurmuk and one from Kosti) without any deaths. Mass vaccination had to be launched in Roseires and Kurmuk areas.

Sporadic cases of Cerebrospinal Meningitis were reported from all the Provinces, with Darfur, Blue Nile and Equatoria heading the records of incidence. The cases recorded totalled 1559 as against 5902 for last year.

Endemic Diseases

A total of 784,010 cases of Malaria was recorded this year as compared to 771,487 last year (see WHO Malaria Project Report).

In the Gezira Irrigated Area, the control of Bilharzia with chemical and mechanical barriers continued.

The incidence of Trypanosomiasis continued to scale down with the regular strict routine inspections and therapeutic prophylaxis by Lomidine. Only 41 cases were recorded as against 86 last year.

Curative Field

On this side, two hospitals, 19 dispensaries and 33 dressing stations were opened during the year.

Namru-3

Stationed at Malakal, this United States Navy Research Unit is carrying out research work in Malakal and Paloich areas in Kala-Azar. A series of papers have been published dealing mainly with epidemiology referring particularly to sand-fly as a vector of Kala-Azar.

The recorded cases for the year of 2486 reflect a sharp drop over last year's figure of 4693.

It is of interest to note that sand flies have been found to be infected with Kala-Azar as well as some of the wild rodents.

INTERNATIONALITY ASSISTED PROJECTS

B. C. G. Campaign

During the year routine testing and vaccination in the provincial permanent centres continued as planned and the activities included school children as well as public groups.

The number tested and vaccinated in these centres totalled respectively 96,949 and 47,735.

A mass campaign was launched in Blue Nile Province (Northern Division). 123,613 were covered with tests of whom 69,436 were vaccinated.

At Wadi Halfa also 8,094 were tested of whom 5,771 were vaccinated.

Thus the total number tested and vaccinated were respectively 228,656 and 122,942.

T.B. Training Centre

During the year the Tuberculosis Control, Demonstration and Training Centre at Wad Medani, continued its various activities according to the standard method established, and covered 6015 new attendants including 1470 contacts. 8488 tuberculin tests and 3591 B. C. G. vaccinations were done. There was a total number of 15,390 attendants and 5980 home visits. 11,916 persons were X-ray filmed.

Nursing College Khartoum

There were 48 girls under training in the 3 classes during the year including the 2 Libyan girls who were admitted at the request of the World Health Organization.

13 girls graduated this year.

School of Dental Assistants-Omdurman

The 2nd. batch has been selected in November, 1962. It is composed of 12 students (male). 6 of them are from Khartoum Hospital, 4 from other hospitals of the outstations, and 2 from the Medical Corps. The course started in November, 1962 under the W.H.O. Adviser Dr. Radwan El Hag, and the National Counterpart Dr. Salah Malik until 25.4.1963 when the contract of the W.H.O. Adviser ended, and Dr. Salah Malik took over as Principal of the School. The students will be graduated in November, 1964 after a course of 2 years, and the graduates will be posted to the outstations to work as Dental Assistants.

Malaria Project

Upon conclusion of the Malaria Pre-Eradication Survey, an agreement was signed on 16.6.1963 between the Government of the Republic of the Sudan and the World Health Organization for a Malaria Pre-Eradication Programme which has already started with the primary objective of assessing the rural and public health infrastructure and their development to undertake the National Malaria Eradication Programme as an integral part of the general health services. Malaria Pre-Eradication activities are at the same time directed to give technical guidance and improve treatment and diagnostic facilities.

During the year under review successful efforts were made to establish a Malaria Eradication Training Centre at Sennar, Blue Nile Province, where suitable premises have been made available. Equipment and supplies were provided by the Government of the Sudan, the Federal German Government and W.H.O. Transport, supplies by the Federal German Government and W.H.O., is expected to be provided by end of 1963. The W.H.O. Technical Instructor to the Malaria Eradication Centre has arrived in May, 1963. W.H.O. will also assign a Malariologist as Senior Adviser. The Malaria Eradication Training Centre is expected to start the courses in 1963/1964.

Rural Health Demonstration Project El Huda

Assistance to villages adversely affected by heavy rains was provided by the staff of this project through organized visits.

Fifteen village-level workers were given training in health subjects by W.H.O. Adviser attached to the Project, and posted in villages around El Huda.

The M.C.H. work initiated at the Centre has been extended to Tabat Sub-Centre.

An experimental hand-flush water seal latrine was constructed at El Huda Hospital. This was the first latrine of its type to be constructed in the Sudan.

During this year, preliminary work in regard to construction of model village houses was undertaken. Soil-cement bricks were cast in El Huda with 'Landnete' machine and the bricks used in construction to test weathering properties.

Small—Pox Vaccination Campaign

A country-wide vaccination campaign against Small—Pox, assisted by the World Health Organization, was launched throughout the Sudan. During the year Darfur, Kordofan, Upper Nile, Bahr El Ghazal and Blue Nile (South Division) were covered and 5,991,435 vaccinations achieved.

Onchocerciasis Control Project

This project actually commenced in late November, 1959 on arrival of the W.H.O. Short-term Consultant Dr. Torrolla who carried out a survey of the disease together with Dr. M. Sherif as his National Counterpart. The survey was completed in February, 1960. Ever since the activities were shouldered by the Ministry of Health staff alone. It consisted of a pilot project for the treatment of sufferers only. In March, 1963 W.H.O. has sent an Entomologist to find out the possibility of establishing a vector control scheme as one of the preventive measures of this disease. So since his arrival the W. H. O. Entomologist, Mr. Marr is carrying out surveys over the Simulium fly infested areas of the country which he is planning to complete in two years time. As a result of this he will decide the possibility of a control scheme. The sufferers treatment Scheme has continued in Bahr El Ghazal Province all through 1962/63. The results have so far been encouraging.

Communicable Eye Diseases Project

This project started operating as a pilot project in Atbara—Berber region of the Northern Province since early 1963. The W.H.O. Senior Adviser Dr. Maichouk arrived in the country on 29th. Dec., 62 to establish a pilot control project to continue for the following two years. So during the year 1962/63 the project consisted of treatment of 10,000 — 12,000 persons of the urban and rural population of the above-mentioned areas including school children. During this period the best practical methods of carrying out a successful treatment scheme have been under trial.

U.N.I.C.E.F.

This Organization is extending appreciable help to mother and child welfare centres, midwifery, nursing schools (junior), tuberculosis, malaria project and school of Hygiene through provision of milk, vitamins, mineral tablets and transport.

FELLOWSHIPS

The following candidates were awarded Study Courses during the year :—

NAME	Nature of Study	Country
Dr. Amin Ali Nadeem	D.P.M. (Diploma in Psychiatry Medicine	Lebanon and U.K.
Dr. Abdel Aziz M. A. Nugud.. ..	Course on National Foci of Infection	U.S.S.R.
Miss Fawzia Mohd. A/Halim Miss Faiza Yousif Zimrawi }	Nursing	U.S.A.
Sayed Osman Mohed. Abdel Nur ..	Medical Entomology	Canada
Sayed Nur Mohed. Ganim Sayed Sayed Mohed. Mahmoud }	Environmental Sanitation and Port Health	U.K.
Dr. Mohed. Rashad Farid	Enteric Diseases	U.S.A.
Dr. Khalid Hassan El Tom Dr. Abdalla Hidyatalla }	D.M.R.T. (Diploma in Medical Radiotherapy)	U.K.
Dr. Mohed. Yousif El Awad Dr. Abdel Hamid El Sayed }	D.P.H.	U.K.
Sayed Bandli Antoun Sayed Ali Saied M. Shatir }	Statistics	Lebanon
Sayed Mudathir Babiker	Laboratory Technician	Lebanon
Dr. Mohd. Abdullahi El Awad ..	Hospital Administration ..	Denmark- Sweden and U.K.
Dr. Abdalla Hassan Kushkush ..	Nutrition Training	U.K. - Nigeria
Dr. Mohd. Sharif Dawood	W.H.O. Inter-Regional Trachoma Training Course	India
Dr. Abbas Mukhtar	W.H.O. Travelling Seminar on Public Health Administration	U.S.S.R.
Dr. Osman Ibrahim	Inter-Regional Travelling Seminar on Occupational Health	Yugoslavia, U.S.S.R., Finland, Sweden and Geneva
Dr. Mohd. El Mardī El Mamoun ..	Travelling Seminar on Training and Utilization of Auxiliary Health Personnel	U.S.S.R.
Dr. Ibrahim Abdel Rahman	Physics	U.K.
Dr. Abdel Halim Mohed. }	Physicians Hospital of the Uni- versity of Belgrad	Yugoslavia
Dr. Abu Bakr Mohd. El Amin Dr. Abdel Gadir Hassan	Eye Hospital of the University of Belgrad	Yugoslavia
Dr. Kamal Zaki Mustafa	F.R.C.S.	U.K.
Dr. Abdel Salam Saleh.. ..	"	"
Dr. Hassan Sid Ahmed Goreish ..	"	"
Dr. Osman Abdel Karim	"	"
Dr. Ahmed A/Aziz Yacoub	Cardiac Surgery	"
Dr. El Sheikh Ahmed Giha	M.R.C.P.	"
Dr. Sir El Khatim A/Magid	"	"
Sayed Abu Bakr Ahmed Akour ..	Laboratory Tech.	"
Sayed Baahir Mohed. Ahmed	"	"
Dr. Sayed Dawood Hassan	Dip. Pathology	"
Dr. Abu Bakr Hassan Amin	"	"
Dr. Ahmed Mahmoud Abbas	"	"
Dr. Yousif Osman	D.I.H.	"
Dr. Hassan Mohed. Hamid	"	"

NAME	Nature of Study	Country
Dr. Ali Ibrahim Mustafa	D. I. H.	U. K.
Sayed Joseph Zaki	Dip. Food Stuff	"
Dr. Abdulla Yousif	Dip. Radiology	"
Dr. Khalid Mohed. El Hag	"	"
Dr. Omer El Farouk Mohed. Fadl	D.P.M.	"
Dr. Abdel Hamid El Sayed Omer	Dip. T.M. and H.	"
Dr. A/Aziz Awad Hilal	"	"
Dr. Abdeen Ahmed Sharaf	" Chest Diseases	"
Dr. Mahmoud Farah Saleh	"	"
Dr. Abbas Hassan El Masri	"	"

9 delegates from the Ministry of Health have attended the following Conferences:—

NAME	Conference	Date
Dr. Khalil Abdel Rahman	F.A.O. Regional Conference Lebanon	30.7.— 8.8., 1962
Dr. T. A. Baasher	Executive Board of World Federation for Mental Health and 15th. Annual Meeting Lima, Peru (Latin America) ..	30 July to 10 Aug., 1962
Dr. T. A. Baasher	W.H.O. Expert Committee on Mental Health, Geneva ..	24 Sept., to 20 Oct., 1962
Dr. M. Z. Mustafa	W.H.O. Sub-Committee 'A' for the Regional Office, Riyad-Saudi Arabia	6-10 Oct., 1962
Dr. Baghir Ibrahim)	Medical Education Conference Iran	16-23 Oct., 1962
Dr. M. O. H. Geritly)		
Dr. Dawood Mustafa)		
Dr. Khalil Abdel Rahman) and Dr. Mahgoub Hamza)	16th. W.H.O. Assembly Geneva	7-25 May, 1963

Some 55 visitors from World Health Organization and various other countries visited the Sudan either in connection with the above-mentioned Projects or on Fellowship Study Tours.

CHAPTER II

ADMINISTRATION

(A) STAFF AND FUNCTIONS

Table I shows the establishment of classified staff. Some categories of the Professional and technical staff were still under establishment. The Table include officials serving on secondment with Local Government Authorities.

Personnel

TABLE I

Statistics of Classified staff Establishment covering the period 1.7.1962 to 30.6.1963.

CATEGORY	Establishment	
	Sudanese	Expatriate
HEADQUARTERS :—		
Under Secretary	1	—
Deputy Under Secretary (Preventive)	1	—
Deputy Under Secretary (Curative)	1	—
Asst. Under Secretary (Rural Health)	1	—
Asst. Under Secretary (Preventive)	1	—
Chief Tuberculosis Division	1	—
Chief Public Health Inspector	1	—
Senior Establishment Officer	1	—
Inspector of Administration	1	—
Establishment Officer	1	—
Asst. Establishment Officer	1	—
Principal School of Hygiene	1	—
Principal Matron	1	—
Asst. Principal Matron	1	—
Head Staff Clerk	1	—
Secretary to Minister of Health	1	—
Staff Clerk	7	—
Senior Clerk	11	—
Clerk (Including T.B.T. Centre)	28	—
Staff Clerk (Statistics)	2	—
Clerk (Statistics)	14	—
Junior Clerk (Including Minister of Health Office) ..	11	—
FINANCE BRANCH: —		
Controller of Accounts	1	—
Inspector of Accounts	1	—
Head Accountant	2	—
Accountant	7	—
Senior Book-Keeper	10	—
Draftsman	1	—
Book-keepers	23	—
Junior Book-keeper	3	—
Saraf	1	—
STORES SECTION :—		
Chief Medical Supplies	1	—
Controller, Medical Stores	1	—
Pharmacist	—	1
Asst. Controller, Medical Stores	1	—
Inspector of Drugs	1	—
Supt. of Stores	3	—
Inspector of Instruments	1	—
Stock Verifier	1	—
Senior Store-Keeper	6	—
Store-Keeper	30	—
Store-Keeper Under Training (Northern Hospitals) ..	10	—
Telephone Operator	1	—
	194	1
HOSPITALS AND DISPENSARIES :—		
Senior Physician and Director-Khartoum Hospital ..	1	—
Senior Surgeon	1	—
Senior Obst. and Gynaecologist	1	—
Senior Ophthalmologist	1	—
Senior Psychiatrist	1	—

CATEGORY	Establishment	
	Sudanese	Expatriate
Physician	9	—
Diseases Specialist	—	1
Cardiological Technician	—	1
Surgeon	12	4
Ear, Nose and Throat Surgeon	—	1
Chest Physician	2	—
Psychiatrist	2	—
Radiologist	2	1
Anaesthetist	4	—
Registrar in Anaesthesia	2	—
Gynaecologist	10	—
Ophthalmologist	13	—
Registrar	4	—
General Duty Doctor (Including Study Courses)	239	5
Houseman	60	—
Senior Dental Surgeon	1	—
Dental Surgeon	5	3
Dental Officer	4	—
Dental Mechanic	—	2
Pharmaceutical Registrar	1	—
Pharmacist	2	—
Lay Administrator	1	—
Supt. Radiography	1	—
Clinical Pathologist	1	—
Senior Dispenser	5	—
Dispenser	23	—
Dispenser Under Training	12	—
Senior Radiographer	1	—
Radiographer	44	—
Asst. Radiographer Under Training	10	—
X-Ray Technician	1	—
Hospital Manager	5	—
Dark Room Technician	1	—
Electrical Engineer	1	—
Laboratory Technician	—	3
Senior Medical Assistants	15	—
Medical Assistant	587	—
Mental Health Assistant	3	—
Ophthalmic Assistant	30	—
Refractionist	20	—
Senior Nursing Instructor	2	—
Nursing Instructor	41	—
Theatre Attendant	89	—
Head Mumarrid	72	—
Senior Clerk	11	—
Clerk	36	—
Card Clerk	3	—
Junior Clerk	25	—
Senior Book-Keeper	15	—
Book-Keeper	22	—
Junior Book-Keeper	53	—
Saraf	2	—
Senior Store-Keeper	1	—
Store-Keeper	28	—
Junior Store-Keeper	66	—
Telephone Operator	6	—
Quarantine Overseer	2	—
NURSING STAFF :—		
Matron Khartoum Hospital	—	1
Matron Omdurman Hospital and N.T. School	—	1
Hospital Matron (W/Medani, Port Sudan El Fasher		

CATEGORY	Establishment	
	Sudanese	Expatriate
Juba, and Atbara.)	4	2
Asst. Matron	7	—
Charge Sister	14	—
Physiotherapist	—	5
Nursing Sister	19	13
School Hospital (Nursing College)	1	—
A/Nursing Sister	29	—
Dietician Sister	—	1
Sister Tutor	1	—
Ward Sister	—	16
Staff Midwifery	6	—
	1693	60
PUBLIC HEALTH :—		
Province Medical Officer of Health	11	—
Asst. Province Medical Officer of Health	9	—
Woman Doctor	1	—
Senior Public Health Inspector	29	—
Public Health Inspector	35	—
Port Health Officer	1	—
Public Health Officer	84	—
Public Health Officer Under Training	60	—
Principal Midwifery Training School	—	1
Principal Health Visitors Training School	1	—
Asst. Chief Public Health Inspector	2	—
Atst. Principal Health Visitors Training School	1	—
Asst. Principal Midwifery Training School	1	—
Health Visitor	44	—
Senior Staff Midwife	6	—
Staff Midwife	17	—
Asst. Supt. Nursing Officer	2	—
Senior Health Visitor	6	—
Supt. Midwifery Training School	6	—
Supt. Nursing Officer	12	—
Senior Sanitary Overseer	1	—
Sanitary Overseer	22	—
Junior Sanitary Overseer	178	—
Public Health Student Under Training	60	—
Senior Technical Clerk	1	—
Clerk	7	—
Junior Clerk	12	—
Junior Book-keeper	1	—
Staff Clerk	3	—
Senior Book-keeper	1	—
Book-keeper	1	—
	615	1
RESEARCH AND LABORATORIES :—		
(A) Stack Medical Research :—		
Asst. Director Research	1	—
Bacteriologist	2	—
Medical Zoologist	1	—
Pathologist	1	—
Registrar	1	—
Supt. Laboratory	1	—
Laboratory Technician	18	—
Laboratory Technician Trainee	8	—

CATEGORY	Establishment	
	Sudanese	Expatriate
Senior Laboratory Assistant	14	—
Laboratory Assistant	116	—
Head Laboratory Attendant	2	—
Junior Technical Assistant.. .. .	1	—
Senior Clerk	1	—
Laboratory Attendant	1	—
Clerk	1	—
Junior Clerk	2	—
(B) <i>Cemical Laboratories (W.C.L.)</i> :—		
Government Analyst	1	—
Deputy Government Analyst	2	—
Asst. Government Analyst	1	—
Scientific Officer	5	—
Chief Pharmaceutical Section	—	1
Senior Technical Assistant	2	—
Pharmaceutical Chemist	1	—
Technical Assistant	8	—
Assistant Scientific Officer Under Training	4	—
Junior Technical Assistant.. .. .	3	—
Clerk	2	—
Library Clerk	1	—
(C) <i>Medical Entomology</i> :—		
Medical Entomologist	—	1
Asst. Scientific Officer Under Training	4	—
Asst. Scientific Officer	1	—
Entomological Technician	1	—
Technical Assistant	1	—
Junior Technical Assistant.. .. .	1	—
Junior Clerk	2	—
(D) <i>Schistosomiasis</i> :—		
Biologist	—	1
Senior Technical Assistant	1	—
Technical Assistant	1	—
Clerk	1	—
Store-keeper	1	—
	215	3
(E) <i>Graphic Museum</i> :—		
Asst. Curator.. .. .	1	—
Technical Assistant	1	—
Museum Attendant	1	—
	3	—

SUMMARY OF CLASSIFIED STAFF 3

SECTION	Establishment	
	Sudanese	Expatriate
Headquarters and Stores Section	194	1
Hospitals and Dispensaries	1,695	60
Public Health	615	1
Stack Medical Research	171	—
Chemical Analytical Section	30	1
Medical Entomology	10	1
Schistosomiasis	4	1
Graphic Museum	3	—
GRAND TOTAL	2,722	65

Unclassified staff excluding Casual labour numbered 8.743 approximately.

PHYSICIANS ETC. PRACTISING IN THE SUDAN

OCCUPATIONS	Government Officials Serving in Min. of Health	Private Practice
Physician (including Chest Physician)	12	—
Surgeon (including E.N. and Throat Surgeon) ..	18	—
Obstet. and Gynaecologist	11	—
Ophthalmologist	14	—
Psychiatrist	3	—
Radiologist	3	—
Anaesthetist	6	—
General Duty Doctor	244	124
Dentist	13	25
Pharmacist	3	60
Dispensers	28	—
Medical Assistant	602	—

(B) LEGISLATION :—

No legislation concerning this Ministry has been enacted during the year.

(C) FINANCE

TABLE 2 (A)

*Income and Expenditure of the Ministry of Health over the last
4 years*

	1959/60	1960/61	1961/62	1962/63
	LS.	LS.	LS.	LS.
<i>Revenue</i>	86,479	96,499	125,554	178,370
<i>Expenditure</i>				
Personnel	2,090,092	2,253,896	1,929,248	2,082,447
Services	1,694,900	2,155,181	2,340,674	2,737,023
Extra-Ordinary	19,890	37,224	40,895	47,225
TOTAL	3,804,882	4,446,301	4,310,817	4,866,695

TABLE 2 (B)
Analysis of Expenditure of the Ministry of Health for
1962/1963

SECTION	Personnel	Services	Extra-Ordinary	Total
	LS.	LS.	LS.	LS.
Headquarters	125,548	778,916	47,225	951,689
Hospitals	1,760,721	1,778,336	—	3,539,057
Hygiene and Public Health	103,776	160,993	—	264,769
Research	90,323	18,778	—	109,101
Graphic Museum	2,079	—	—	2,079
Seconded Staff	—	—	—	—
TOTAL	2,082,447	2,737,023	47,225	4,866,695

REMARKS :- 1962/1963 figures are based on actual expenditure.

CHAPTER III
PUBLIC HEALTH
(A) HEALTH OF OFFICIALS
TABLE 3

NATIONALITY	Number of Officials Employed	Number Placed on Sick List	Number of Days Sick	AVERAGE DAYS SICKNESS	
				For all Officials	For Those Who were Sick
Sudanese	18,784	7,991	37,824	2.01	4.73
Non-Sudanese	497	41	231	0.46	5.63

(B) GENERAL HEALTH
EXPANSION OF HOSPITAL SERVICES

The following Hospitals were opened for work during the year :—

<u>HOSPITAL :</u>	<u>No. of Beds</u>
Burram (Darfur Province)	60
El Zeidab (Northern Province)	60

The building of the following 60 bedded Hospitals were completed during the year. They will operate soon :—

El Hassaheissa.
El Managil.

Yirrol, Kuttum, Abboud and Hawata Hospitals are still under consideration.

Other buildings that were completed during the year appear in the following List :—

PROVINCE		LOCALITY	BUILDING ERECTED
Bahr El Ghazal	..	Aweil Aweil Rumbeik " Yirrol	Public Health Officer's House Equipment Store. 8—bedded 2nd. Class Ward X-Ray Department. Office and Store for P.H.O.
Blue Nile	..	.. Sennar Singa Kosti Roseires	Out-Patient Department. 2nd. Class Wards—Male and Female. Out-Patient Department. 10-bedded ward at Geissan.
Darfur	..	.. Nyala " " Zalingei " Kuttum	Two-8-bedded paying wards. Health Centre. X-Ray Unit. 4-bedded Maternity ward. Public Health Office and Junior Standard Quarter. Public Health Office and Junior Standard Quarter.
Equatoria	..	.. Juba " Yei " Maraidi Li-Rngu " " " "	Junior Standard Quarter for P.H.O. " " " " " S/Keeper. Two 20 bedded wards. Store. X-Ray Department Store. Office for Store-Keeper. Medical Assistant's House.
Kassala	..	.. Kassala " Gedaref " Aroma " " " " " "	House for A/Province Medical Officer of Health. 4 Offices for Specialist Doctors. Senior House for A/P.M.O.H. Out-Patient Department. 1st. Class Ward. Quarantine Building 4 Junior Houses. Office and Store for Public Health. Middle House for Public Health Officer.
		.. Port Sudan " " " " Tokar " "	Senior Standard Quarter for Gynaecologist. 4 Offices for Hospital. Doctors Mess. Mess for Mumaridat. Middle Standard Quarter for Medical Asst. 10-bedded ward (Female). Middle Standard Quarter for Medical Officer. Public Health Office and Store.
Kordofan	..	.. Kadugli Nahud Dilling Bara " Um Ruaba " " " Delami	X-Ray Department. X-Ray Department. 2nd. Class Paying Ward. Two 3rd. Class Wards. Administrative Block and Kitchen. 20-bedded 3rd. Class Ward. 1st. Class Ward. 2nd. Class Ward. House for Medical Assistant.
Northern	..	.. Dongola Berber Shendi	X-Ray Department. X-Ray Department. X-Ray Department.

The Programme of expansion of Dispensaries and Dressing Stations included the following additions :—

PROVINCE						New Dispensaries	New Dressing Stations
Bahr El Ghazal	..	..	..	..	..	1	—
Blue Nile	..	..	..	..	..	11	14
Darfur	..	..	..	..	..	—	—
Equatoria	..	..	..	..	..	—	1
Kassala	..	..	..	..	..	—	5
Khartoum	..	..	..	..	..	—	1
Kordofan	..	..	..	..	..	1	8
Northern..	..	..	..	..	..	4	3
Upper Nile	..	..	..	..	..	2	1
TOTAL	..	..	..	..	..	19	33

TABLE 4
Work done in Hospitals and Dispensaries for 10 Years

YEAR					Admissions	Attendances	Operations
1953/54	..	..	..	..	172,675	14,483,366	34,432
1954/55	..	..	..	..	171,092	16,453,892	38,285
1955/56	..	..	..	..	154,093	17,694,550	38,287
1956/57	..	..	..	..	176,761	20,430,070	53,839
1957/57	..	..	..	..	175,543	21,410,339	50,023
1958/59	..	..	..	..	216,538	24,730,041	64,556
1959/60	..	..	..	..	185,601	23,999,256	86,771
1960/61	..	..	..	..	190,962	29,932,923	88,992
1961/62	..	..	..	..	219,188	28,970,936	109,731
1962/63	..	..	..	..	205,020	33,697,201	124,409

There were 124 licensed private practitioners working independently during the year under review. The figures of their work do not appear in the above list.

ACTIVITIES OF SPECIAL DEPARTMENTS
IN HOSPITALS

Dental Clinics

Work done by these Departments in all Provinces during the year is as follows :—

No. of Attendances	..	..	..	..	..	..	134,037
Extractions	..	..	..	..	..	..	96,381
Conservations	..	..	..	..	..	..	6,352
Scaling and Gum Treatment	..	..	..	..	..	..	11,545
Minor Oral Surgical Cases	..	..	..	..	..	..	2,962

X-Ray Treatment—Khartoum

Number of X-Ray Films taken for Out-Patients and In-Patients during the year was 31,068.

Physiotherapy Department—Khartoum

Number of attendances during the year was 47,355. Total number of patients was 2,617.

(C) VITAL STATISTICS

Below is the estimated population of the Sudan rendered by the Department of Statistics as on 30th June, 1963 :—

TABLE 5

Approximate Estimation of Population by Provinces

PROVINCE	Men	Women	Children	Total
Bahr El Ghazal	384,000	365,000	544,000	1,293,000
Blue Nile	730,000	696,000	1,157,000	2,583,000
Darfur	444,000	519,000	662,000	1,625,000
Equatoria	328,000	346,000	436,000	1,110,000
Kassala	429,000	320,000	463,000	1,212,000
Khartoum	207,000	162,000	264,000	633,000
Kordofan	644,000	648,000	904,000	2,196,000
Northern	256,000	309,000	501,000	1,066,000
Upper Nile	343,000	317,000	452,000	1,112,000
TOTAL	3,765,000	3,682,000	5,383,000	12,830,000

TABLE 6

*Estimated Population of Khartoum, Khartoum North
and Omdurman*

Khartoum	133,000
Omdurman	163,000
Khartoum North	57,000
Rutal Areas	280,000
TOTAL	633,000

TABLE 7

Crude Birth Rate—Khartoum, Khartoum North and Omdurman

TOWN							No. of Registered Births	Crude Birth Rate
Khartoum	..	..	..	..	..	..	5,940	44.7
Khartoum North and Rural Areas	..	..	..	..	..	..	6,455	19.2
Omdurman	..	..	..	..	..	..	5,884	36.1
TOTAL	..	..	..	..	..	..	18,279	28.9

The above figures shows births attended and registered by licensed midwives. Births attended by unlicensed midwives are not registered. So the above crude birth rate is not complete.

(D) PREVENTIVE MDICINE

1. Insect Borne Diseases

(i) **Malaria** : This disease is onof the major Public Health Problems. Residual adult mosquito control with Gammexane Spraying is gradually being expaled in all Provinces. Larval controlis being effected in big towns with gardens and Agricultural Schemes.

Following tableseven figures for cases and control activities.

TABLE 8
MALARIA INCIDENCE

YEAR	BAHR EL GHAZAL			BLUE NILE			DARFUR			EQUATORIA			KASSALA			KHARTOUM			KORDOFAN			NORTHERN			UPPER NILE		
	Cases	D.	Mean Rain-fall mm.	Cases	D.	Mean Rain-fall mm.	Cases	D.	Mean Rain-fall mm.	Cs	D.	Mean Rain-fall mm.	Cases	D.	Mean Rain-fall mm.	Cases	D.	Mean Rain-fall mm.	Cases	D.	Mean Rain-fall mm.	Cases	D.	Mean Rain-fall mm.	Cases	D.	Mean Rain-fall mm.
1958/59 ..	17,025	44	1,016	96,404	45	432	47,990	19	576	458	145	1,409	56,914	28	219	21,078	8	167	144,485	51	416	15,923	3	28	30,136	18	741
1959/60 ..	16,916	36	936	74,150	25	462	41,390	23	533	1667	77	1,298	74,634	37	321	20,257	10	294	189,548	74	544	16,346	3	80	29,226	29	802
1960/61 ..	31,592	35	1,021	77,620	25	353	67,198	16	548	1966	107	1,248	57,074	17	224	17,631	3	79	160,908	79	515	14,850	4	214	52,472	50	806
1961/62 ..	28,140	54	1,094	100,356	41	469	89,847	27	584	2673	131	1,667	87,533	35	298	31,098	8	239	141,838	93	507	14,875	9	50	43,127	21	927
1962/63 ..	34,832	68	1,119	67,744	25	495	96,748	28	541	2889	80	1,480	76,379	1	305	27,876	3	208	94,164	142	557	13,126	13	60	133,252	15	912

SPECIES OF PARASITES IN 7,176 POSITIVE SLIDES

PROVINCE				<i>P. Falciparum</i>	<i>P. Vivax</i>	<i>P. Maje</i>
Bahr El Ghazal	..	..	..	516	27	-
Blue Nile	..	..	..	887	91	-
Darfur	..	..	..	477	122	-
Equatoria	..	..	..	1,662	1	-
Kassala	..	..	..	427	37	-
Khartoum	..	..	..	213	22	-
Kordofan	..	..	..	1,525	217	-
Northern	..	..	..	544	38	-
Upper Nile	..	..	..	276	80	-
TOTAL	..	..	..	6,527	635	-

SPRAYING ACTIVITY IN THE WHOLE COUNTRY

PROVINCE			Provisional Census	No. of Population Protected	No. of Rooms, etc. Sprayed	Amount of Insecticides Used (LB.)
Bahr El Ghazal	..	..	1,293,000	41,155	23,299	24,586
Blue Nile	..	..	2,583,000	1,440,591	1,840,568	321,071
Darfur	..	..	1,625,000	197,358	151,917	17,010
Equatoria	..	..	1,110,000	99,667	64,954	20,234
Kassala	..	..	1,212,000	472,783	480,401	67,422
Khartoum	..	..	633,000	723,198	155,516	11,900
Kordofan	..	..	2,196,000	712,581	315,024	58,421
Northern	..	..	1,066,000	806,662	862,494	678,734
Upper Nile	..	..	1,112,000	95,245	71,342	9,786
TOTAL	..	..	12,830,000	4,589,240	3,965,515	1,209,164

MALARIA PRE-ERADICATION SURVEY AND MALARIA PRE-ERADICATION PROGRAMME SUMMARY REPORT 1962/63

During the year under review the Malaria Pre-Eradication Survey has been completed. The malarionetrical survey which actually has started on 1.2.1961, yielded the following results :—

AREA :	SPLENOMETRY		PARASITOLOGICAL RESULTS				SPECIES DISTRIBUTION (in %)			
	No. of child exam.	S.R. in % (av.)	No. of child. exam.	P.R. in % (av.)	No. of inf. exam.	P.R. in % (av.)	p.f.	p.v.	p.m.	p.ov.
NORTHERN PROVINCE *	**	**	3,646	0.16	286	0.35	57	—	43	—
KHARTOUM PROVINCE *	4,100	6.6	**	—	—	—	**	—	—	—
KASSALA PROV.-NORTH	1,348	5.5	1332	0.30	49	0.	—	—	—	—
KASSALA PROV.-S.pre-seas *	4,475	13.5	3,582	1.1	448	1.3	96	—	4	—
KASSALA PROV.-S.post.seas *	—	—	1,022	10.6	68	8.8	86	13	1	—
BLUE NILE PROV.-West *	2,854	17.2	2,810	6.9	209	5.7	61	8	31	—
GEZRIA IRRG. AREA *	**	**	1,345	3.1	74	1.4	14	43	43	—
KORIOFAN *	****	****	4,538	20.9	724	15.2	80	2	18	—
UPPER NILE PROVINCE	2,920	60.0	2,728	47.8	750	45.7	57	4	39	—
DARFUR	****	****	2,797	26.1	324	11.4	77.4	1.4	21.1	0.1
BAHR EL GHAZAL	2,857	67.9	2,822	57.1	282	53.9	87.1	0.3	12.6	—
EQUATORIA	2,861	75.3	3,944	81.4	396	76.3	83.6	2.6	13.8	—

* Areas under large scale residual spraying with BHC
 ** Splenometric results not conclusive due to schistosomiasis
 *** Parasitological results after 2 dry years not conclusive, therefore fever cases survey established.
 **** Kordofan : Splenometric survey, south. Kordofan only : S.R. 58.5%
 Darfur : Splenometric survey in Nyala, Zalingei and Geneina Districts only : S.R. 64.3%

As in Khartoum Province and in Kassala Province North (Red Sea Region) the general parasitological surveys did not yield conclusive results, fever cases surveys were established. Observations:

				No. of Fever Examined	Cases Positive	% of Slides Positive	Species Distribution		
							p.f.	p.v.	p.m.
Khartoum Province 1961/62									
Season	..	..	..	3,484	681	19.5—	87	11	2
Red Sea Region 1961/62									
Season	..	..	..	576	95	15.3—	78	10	11

As the main malaria vectors were incriminated *Anopheles gambiae* and *Anopheles funestus*, the latter species being restricted to central and Southern Sudan. *A. pharoensis* could not yet be incriminated as a local malaria vector though this species may transmit the disease under favourable epidemiological conditions. Whereas *A. gambiae* and *A. funestus* are still fully susceptible to DDT and Dieldrin, *A. Pharoensis* shows in the areas which are exposed to agricultural insecticide spraying, a full resistance to Dieldrin, the susceptibility to DDT also being reduced though still within technically feasible range.

Upon conclusion of the Malaria Pre-Eradication Survey, an agreement was signed on 16.6.1963 between the Government of the Republic of the Sudan and the World Health Organization, for a Malaria Pre-Eradication Programme. This Programme has already started, its primary objective being the assessment of the Rural and Public Health Infrastructure and their development to the level enabling them to support a National Malaria Eradication Programme. This aim is to be reached by integration of malaria eradication activities with the work of the general health service, technical guidance being given by the Malaria Eradication Service, Ministry of Health. Prior to the full swing Malaria Eradication Programme, the Malaria Pre-Eradication Programme will already make efforts to improve and to standardize malaria treatment and diagnostic facilities.

During the year under review successful efforts were made to establish a Malaria Eradication Training Centre at Sennar/B.N.P. at Sennar—Geneina suitable premises became available, which were adjusted to the Centre's requirements and thoroughly maintained. Equipment and supplies were made available by the Government of the Sudan, the Federal German Government and W.H.O. Transport, supplied by the Federal German Government and W.H.O., is expected to be provided by end of 1963. The W.H.O. Technician Instructor to the Malaria Eradication Training Centre has arrived in May, 1963. W.H.O. will also assign a Malariologist as Senior Adviser. The Malaria Eradication Training Centre is expected to start the courses in 1963/1964.

- (ii) **Blackwater Fever** : 1 case was reported this year compared with 2 cases last year.
- (iii) **Relapsing Fever** : No case was reported this year, compared with 7 cases last year.

TABLE 9
Relapsing Fever Cases and Deaths Over the Last Ten Years

YEAR	Cases	Deaths
1953/54	91	8
1954/55	3	1
1955/56	1	—
1956/57	4	—
1957/58	2	—
1958/59	—	—
1959/60	6	—
1960/61	22	—
1961/62	7	—
1962/63	—	—

- (iv) **Leishmaniasis** : 2,486 cases were reported this year as compared with 4,693 last year. Most of the cases were reported from Blue Nile, Upper Nile and Kassala Provinces.

TABLE 10
Leishmaniasis Province Distribution 1962/63

PROVINCE	Cases	Deaths
Bahr El Ghazal	2	—
Blue Nile	1,132	20
Darfur	5	—
Equatoria	156	10
Kassala	426	38
Khartoum	32	4
Kordofan	178	6
Northern	—	—
Upper Nile.. .. .	555	5
TOTAL	2,486	83

TABLE 11
Leishmaniasis Recorded Incidence in Ten Years

YEAR									No. of Cases
1953/54	..	..	..	..	..	..	..	..	895
1954/55	..	..	..	..	..	..	..	..	1,106
1955/56	..	..	..	..	..	..	..	..	1,889
1956/57	..	..	..	..	..	..	..	..	7,463
1957/58	..	..	..	..	..	..	..	..	3,939
1958/59	..	..	..	..	..	..	..	..	8,414
1959/60	..	..	..	..	..	..	..	..	4,017
1960/61	..	..	..	..	..	..	..	..	5,077
1961/62	..	..	..	..	..	..	..	..	4,693
1962/63	..	..	..	..	..	..	..	..	2,486

(v) **Trypanosomiasis** : New cases detected were 41 with no deaths. In 1961/62 cases reported were 86 with 3 deaths.

The disease is endemic in the Western Districts of Equatoria Province. Regular Sleeping Sickness inspection is carried out in all endemic areas for case finding. Chemo-prophylaxis is being conducted in Yambio and Yei Districts.

Following Table shows the distribution of cases for 10 years in Equatoria Province.

TABLE 12
Trypanosomiasis : Distribution of Cases in Equatoria in Ten Years

YEAR			Tembura Sub-Dist.	Yambio	Yei	Maridi	Other Localities	Total
1953/54	..	..	12	148	44	—	—	204
1954/55	..	..	—	467	92	1	1	561
1955/56	..	..	2	210	98	—	—	310
1956/57	..	..	18	871	74	4	4	971
1957/58	..	..	34	37	88	—	—	159
1958/59	..	..	8	37	118	4	2	169
1959/60	..	..	24	—	223	—	15	262
1960/61	..	..	19	1	258	—	2	280
1961/62	..	..	13	—	65	—	3	81
1962/63	..	..	14	1	23	1	2	41

(iv) **Filariasis** : 4,705 cases were microscopically diagnosed during the year out of which 4,445 cases were reported from Equatoria Province.

2. EPIDEMIC AND ENDEMIC DISEASES

(i) **Yellow Fever** : No case of Yellow Fever was reported this year.

(ii) **Anthrax** : 59 cases with no deaths were reported this year, out of which 56 cases were reported from Kassala Province.

(iii) **Cerebrospinal Meningitis**: 1,559 cases with 137 deaths were reported during the year as compared with 5,902 cases and 431 deaths last year.

TABLE 13

*Cereprospinal Meningitis Recorded Incidence
and Fatality by Province during 1962/1963*

PROVINCE							Cases	Deaths	Fatality Rate
Bahr El Ghazal	..	..	..	..	..	..	99	14	14.1
Blue Nile	..	..	..	..	..	..	385	27	7.0
Darfur	..	..	..	..	..	..	517	29	5.6
Equatoria	..	..	..	..	..	..	223	35	15.7
Kassala	..	..	..	..	..	..	87	12	13.8
Khartoum	..	..	..	..	..	..	61	6	9.8
Kordofan	..	..	..	..	..	..	114	13	11.4
Northern	..	..	..	..	..	..	5	1	20.0
Upper Nile	..	..	..	..	..	..	68	—	—
TOTAL							1,559	137	8.8

TABLE 14

*Cerebrospinal Meningitis Recorded Incidence
and Fatality in Ten Years*

YEAR							Cases	Deaths	Fatality
1953/54	..	..	..	..	..	..	8,942	827	9.2
1954/55	..	..	..	..	..	..	3,470	492	14.2
1955/56	..	..	..	..	..	..	9,028	828	9.2
1956/57	..	..	..	..	..	..	5,888	578	9.8
1957/58	..	..	..	..	..	..	2,008	178	8.9
1958/59	..	..	..	..	..	..	1,179	208	17.6
1959/60	..	..	..	..	..	..	1,459	181	12.4
1960/61	..	..	..	..	..	..	7,837	461	5.9
1961/62	..	..	..	..	..	..	5,902	431	7.3
1962/63	..	..	..	..	..	..	1,559	137	8.8

(iv) **Diphtheria**: 658 cases with 46 deaths were reported this year as compared with 1078 cases and 83 deaths last year.

TABLE 15

*Diphtheria : Recorded Incidence and
Fatality by Provinces-1962/63*

PROVINCE						Cases	Deaths	Fatality Rate
Bahr El Ghazal	..	..	..	..	..	2	—	—
Blue Nile	..	..	..	..	..	193	9	4.7
Darfur	..	..	..	..	..	19	4	21.1
Equatoria	..	..	..	..	..	11	1	9.1
Kassala	..	..	..	..	..	62	5	8.1
Khartoum	..	..	..	..	..	127	4	3.1
Kordofan	..	..	..	..	..	103	11	10.7
Northern	..	..	..	..	..	138	10	7.2
Upper Nile	..	..	..	..	..	3	2	66.7
TOTAL						658	46	7.0

TABLE 16

*Diphtheria : Recorded Incidence
and Fatality in Ten Years*

YEAR						Cases	Deaths	Fatality Rate
1953/54	..	..	..	..	..	335	27	8.1
1954/55	..	..	..	..	..	369	61	16.5
1955/56	..	..	..	..	..	356	38	10.7
1956/57	..	..	..	..	..	1,497	52	3.5
1957/58	..	..	..	..	..	506	38	7.5
1958/59	..	..	..	..	..	859	52	6.1
1959/60	..	..	..	..	..	940	91	10.3
1960/61	..	..	..	..	..	691	48	6.9
1961/62	..	..	..	..	..	1,078	83	7.7
1962/63	..	..	..	..	..	658	46	7.0

(v) Dysentery : 5,491 cases were treated in hospitals as in-patients and 278,164 as out-patients.

(vi) Enteric Fever : 1,144 cases with 25 deaths were reported during the year.

TABLE 17

Enteric Fever : Province Distribution 1962/63

PROVINCE						Case	Deaths
Bahr El Ghazal	..	..	..	..	..	—	—
Blue Nile	..	..	..	..	..	414	4
Darfur	..	..	..	..	..	—	—
Equatoria	..	..	..	..	..	7	—
Kassala	..	..	..	..	..	56	2
Khartoum	..	..	..	..	..	459	8
Kordofan	..	..	..	..	..	9	1
Northern	..	..	..	..	..	112	3
Upper Nile	..	..	..	..	..	87	7
TOTAL						1,144	25

TABLE 18

Enteric Fever : Recorded Incidence in Ten Years

YEAR						Cases	Deaths
1953/54	..	..	..	..	..	560	42
1954/55	..	..	..	..	..	548	34
1955/56	..	..	..	..	..	449	23
1956/57	..	..	..	..	..	410	31
1957/58	..	..	..	..	..	361	32
1958/59	..	..	..	..	..	687	19
1959/60	..	..	..	..	..	763	35
1960/61	..	..	..	..	..	578	14
1961/62	..	..	..	..	..	1,171	52
1962/63	..	..	..	..	..	1,144	25

(vii) **Gastro-Enteritis of Children :** Records of Hospitals and Dispensaries registered 286,462 cases of which 7,691 required hospitalization with 699 deaths (a fatality rate of 9.1 per-cent of the total admissions).

(viii) **Leprosy :** During the year 430 new cases were diagnosed as bacteriologically positive of which 327 cases were distributed between Equatoria and Bahr El Ghazal Provinces.

(ix) **Poliomyelities :** 243 cases were recorded this year of which 118 received hospital treatment; 4 deaths reported. Last year 244 cases with 9 deaths were reported.

(x) **Hydrophobia :** 34 cases of human rabies were admitted to hospitals this year.

(xi) **Small-Pox :** The total number of cases reported was 95 with no death as compared with 8 cases and with no death last year. All of the 95 cases were reported from Blue Nile Province.

In February, 1962 a country-wide vaccination campaign against Small-Pox assisted by the World Health Organization, was started. The Provinces covered, and vaccinations performed during the year were as follows :—

Bahr El Ghazal (2.12.62—15.3.63)	..	..	..	442,176
Blue Nile (Southern Division) (15.1.63—31.3.63)	..			898,578
Darfur (Feb., 62-Aug., 62)	..	..	..	1,843,052
Kordofan (Feb., 62-Aug., 62)	..	..	..	1,503,652
Upper Nile (Dec., 62-March, 63)	..	..	..	931,740
TOTAL	..	..	..	5,619,198

TABLE 19
*Small—Pox : Incidence and Vaccinations Performed
In Ten Years*

YEAR	Cases	Vaccinations
1953/54	3,030	1,500,000
1954/55	4,200	1,203,673
1955/56	1,427	1,748,190
1956/57	25	648,501
1957/58	295	2,678,223
1958/59	380	2,440,084
1959/60	336	633,275
1960/61	162	1,830,156
1961/62	8	3,418,539
1962/63	95	5,619,198

(xii) **Influenza** : 82,033 cases with 22 deaths were reported during the year compared with 82,347 cases with 19 deaths last year.

(xiii) **Tuberculosis** : During the year routine testing and vaccination in the Provincial permanent centers continued as planned and the activities included school children as well as public groups.

The numbers tested and vaccinated in these centres totalled respectively 96,949 and 47,735.

In February, 1963 a team was despatched to Wadi Halfa to launch a campaign starting in the population section that will be moved to the Resettlement Area at Khashm El Girba. So far 8,094 persons were covered with test of whom 5,771 were vaccinated.

In the Blue Nile Province (Northern Division) a mass campaign was launched in accordance with the recommendation based on the result of the Tuberculosis prevalence survey. The operations started in March, 1963 and four teams were assigned for the work. So far 123,613 persons were covered with test of whom 69,436 were vaccinated. The campaign has temporarily come to a halt on account of the onset of the rainy season and will be resumed by the next dry season.

Following is a table of tests and vaccinations performed during the year :—

CENTRE	No. Tested	No. Positive	No. Vaccinated	Neg. No. Vaccinated	Absent
Head-Quarter Team	18,220	6,136	11,121	61	902
Medani Centre	7,968	3,077	3,447	728	716
El Obeid Centre	25,965	7,566	15,662	29	2,708
Port Sudan Centre	3,745	1,361	1,922	38	424
Wau Centre	5,410	2,502	2,344	50	514
Wadi Halfa Team	8,094	1,704	5,771	37	582
Juba Team	6,696	2,466	3,831	8	391
Kassala Centre	4,830	854	3,501	11	464
Atbara Centre	4,745	960	3,329	40	416
Thavira Centre	19,370	6,710	2,578	6,999	3,083
Blue Nile Mass Campaign	123,613	26,592	69,436	1,151	26,434
GRAND TOTAL	228,656	59,928	122,942	9,152	36,634

Gross Percentage of Neg. Reactors = 68.7%
 ” Percentage of Return = 84 %

TABLE 20

*Tuberculosis : Province Distribution of Admissions
to Hospitals—1962/1963*

PROVINCE						Pulmonary	Non- Pulmonary	Total
Bahr El Ghazal	..	..	..	..	..	245	123	368
Blue Nile	..	..	..	..	..	1,041	226	1,267
Darfur	..	..	..	..	..	182	61	243
Equatoria	..	..	..	..	..	224	60	284
Kassala	..	..	..	..	..	695	316	1,011
Khartoum	..	..	..	..	..	820	209	1,029
Kordofan	..	..	..	..	..	628	189	817
Northern	..	..	..	..	..	247	85	332
Upper Nile	..	..	..	..	..	294	256	550
TOTAL						4,376	1,525	5,901

TABLE 21

Tuberculosis : Admissions to Hospitals in Ten Years

YEAR						Pulmonary	Non- Pulmonary	TOTAL
1953/54	..	..	..	..	..	2,075	798	2,873
1954/55	..	..	..	..	..	2,868	915	3,783
1955/56	..	..	..	..	..	2,697	823	3,520
1956/57	..	..	..	..	..	3,175	1,005	4,180
1957/58	..	..	..	..	..	3,749	1,061	4,810
1958/59	..	..	..	..	..	3,864	1,135	4,999
1959/60	..	..	..	..	..	4,263	1,297	5,560
1960/61	..	..	..	..	..	4,402	1,310	5,712
1961/62	..	..	..	..	..	4,461	1,180	5,641
1962/63	..	..	..	..	..	4,376	1,525	5,901

TABLE 22

*Tuberculosis: Age Distribution of 5173 Cases of the Cases
Admitted to Hospital 1962/63 No. of Persons and Percentages*

AGE GROUPS IN YEARS											
		0-1	2-5	6-15	16-25	26-35	36-45	46-65	OVER 65	UNDE- FINED	TOTAL
TUBERCULOSIS	..	0.1	2.5	6.15	16.25	26.35	36.45	46.65	OVER 65	UNDE- FINED	TOTAL
CASES PULMONARY		14	44	164	626	1215	1013	614	176	7	3873
PERCENTAGE ..	..	0.4	1.1	4.2	16.1	31.4	26.2	15.9	4.5	0.2	100
CASES NON-PULMONARY		6	46	144	267	304	267	179	73	14	1300
PERCENTAGE ..	..	0.5	3.5	11.1	20.5	23.4	20.5	13.8	5.6	1.1	100

TABLE 23

*Tuberculosis : Site of Main Lesion in 1270 of the Non-Pulmonary
Cases Admitted to Hospital 1962/1963*

SITE OF MAIN LESION									Cases	Percentage
Gland	..	..	..	..	..	..	..	..	380	29.9
Bone	..	..	..	..	..	..	..	..	447	35.2
Joint	..	..	..	..	..	..	..	..	216	17.0
Abdominal	..	..	..	..	..	..	..	..	129	10.2
Skin	..	..	..	..	..	..	..	..	50	3.9
Genito Urinary	..	..	..	..	..	..	..	..	29	2.3
Meningeal	..	..	..	..	..	..	..	..	19	1.5
TOTAL	..	..	..	..	..	..	..	..	1270	100.0

TABLE 24

*Tuberculosis : 1962/63 Province Distribution of all Cases
Diagnosed*

P R O V I N C E							Pulmonary	Non-Pulmonary	Total
Bahr El Ghazal	..	..	..	..	..	..	591	608	1,199
Blue Nile	..	..	..	..	..	..	1,267	910	2,177
Darfur	..	..	..	..	..	..	324	198	522
Equatoria	..	..	..	..	..	..	364	261	625
Kassala	..	..	..	..	..	..	1,253	1,090	2,343
Khartoum	..	..	..	..	..	..	1,493	1,117	2,610
Kordofan	..	..	..	..	..	..	690	404	1,094
Northern	..	..	..	..	..	..	636	173	809
Upper Nile	..	..	..	..	..	..	1,848	2,163	4,011
TOTAL	..	..	..	..	..	..	8,466	6,924	15,390

3. HELMENTHIC DISEASES

(i) **Ankylostomiasis** : 11,174 cases were recorded this year, of which 10,693 were reported from the Southern Provinces.

(ii) **Dracontiasis** : 3,952 cases were treated during the year, of these 3,401 were reported from the Southern Provinces.

(iii) **Bilharzia (Schistosomiasis)** : 55,927 cases were recorded during the year.

The Snail Control continued in the same lines as before *i.e.* mechanical trapping, chemical traps and regular inspections in search of snails.

TABLE 25

Bilharzia in Gezira Irrigated Area 1958/1959 to 1962/1963

Y E A R	H A E M A T O B I U M						M A N S O N I					
	C H I L D R E N			A D U L T S			C H I L D R E N			A D U L T S		
	Ex- amined No.	Found No.	Infected %	Ex- amined No.	Found No.	Infected %	Ex- amined No.	Found No.	Infected %	Ex- amined No.	Found No.	Infected %
1958/1959	40,260	912	2.3	48,245	823	1.7	40,260	1,807	4.5	48,245	2,500	5.2
..	..	..	..	..	..	..	..	..	..	..	..	..
1959/1960	61,314	1,306	2.1	84,678	1,459	1.7	61,314	2,892	4.7	84,678	4,209	5.0
..	..	..	..	..	..	..	..	..	..	..	..	..
1960/1961	69,589	956	1.4	97,798	1,190	1.2	69,589	3,201	4.6	97,798	4,583	4.7
..	..	..	..	..	..	..	..	..	..	..	..	..
1961/1962	69,497	1,035	1.4	110,177	1,330	1.2	69,497	2,942	4.2	110,177	5,035	4.6
..	..	..	..	..	..	..	..	..	..	..	..	..
1962/1963	101,215	1,075	1.1	150,825	2,124	1.4	101,215	4,315	4.3	150,825	8,237	5.5
..	..	..	..	..	..	..	..	..	..	..	..	..

TABLE 26

Bilharzia: Province Distribution 1962/1963

P R O V I N C E	Cases	Deaths
Bahr El Ghazal	803	1
Blue Nile	22,256	11
Darfur	11,533	1
Equatoria	3,770	5
Kassala	751	1
Khartoum	6,004	—
Kordofan	5,744	4
Northern	4,674	1
Upper Nile	392	—
T O T A L	55,927	24

TABLE 27

Bilharzia: Incidence in Ten Years

1953/54	30,725
1954/55	37,570
1955/56	31,741
1956/57	43,863
1957/58	41,645
1958/59	45,094
1959/60	47,345
1960/61	52,877
1961/62	57,218
1962/63	55,927

(E) SANITARY CIRCUMSTANCES**WATER SUPPLIES**

Improvement of town and rural water supply continues. Controlled water yards and protected Haffirs and deep bore wells for rural and nomadic areas are expanding.

REFUSE DISPOSAL

Mainly in towns, this is being carried out by orthodox methods of daily collection, dumping, and burning.

SEWAGE DISPOSAL

The sewage works in Khartoum Town are gradually replacing the bucket system. It has not yet covered the whole town.

In other towns bucket system, aqua-privy, septic tank and pit latrine are in use.

HOUSING AND TOWN PLANNING

The usual measures to ensure good housing and avoid over-crowding and insanitary conditions are being taken by the authorities concerned in re-planning town expansion and new layouts.

CHAPTER IV

SOCIAL HYGIENE

Midwifery

The following Table shows the midwifery training Schools. date of foundation of each school, total number of midwives trained and number under training during 1962/63 :—

TABLE 28
Midwifery Training Schools

SCHOOL	Date of Opening	Total Midwives Trained since Opening	No. of Midwives Under Training 1962/1963
Omdurman	1920	1055	25
El Obeid	1948	134	18
Juba	1950	64	10
Malakal	1952	53	10
Wad Medani	1953	137	20
Atbara	1955	93	14
Kassala	1957	34	12
El Fasher	1958	28	10
TOTAL ..		1598	119

TABLE 29

*Distribution of Licensed Midwives in the Sudan—
1962/1963*

PROVINCE	District Midwives	Certified Nurse Midwives	Staff Midwives	Staff Nurses	Health Visitors	Uncertified Nurse Midwives	Total
Bahr El Ghazal	17	—	—	—	—	2	19
Blue Nile ..	237	23	5	6	11	10	292
Darfur	62	12	3	4	2	1	84
Equatoria ..	39	2	2	2	1	32	78
Kassala	60	15	4	5	5	1	90
Khartoum ..	183	68	6	26	11	—	294
Kordofan ..	164	22	4	5	2	3	200
Northern ..	204	22	4	3	4	4	241
Upper Nile ..	46	—	2	2	1	2	53
TOTAL ..	1,012	164	30	53	37	55	1,351

TABLE 30

New Midwifery Certificates Issued during 1962/63

PROVINCE	Certificated Nurse Midwives	Village Midwives	TOTAL
Bahr El Ghazal	—	—	—
Blue Nile	1	19	20
Darfur	3	7	10
Equatoria	—	10	10
Kassala	2	10	12
Khartoum	3	22	25
Kordofan	2	16	18
Northern	—	14	14
Upper Nile	—	10	10
TOTAL	11	108	119

Health Visitors School-Omdurman

The School was first opened during November, 1959.

The Course is one academic year.

The candidate must possess elementary School certificate, Nursing Certificate Midwifery Certificate and Staff Midwifery Certificate before joining the School.

Total number of Health Visitors graduated from School till now is 45.

There are 10 students in the School at present.

Maternal and Child Health

Improvement and expansion in this important service continued. Three new Maternity and Child Welfare Centres were opened during the year and training of staff maintained.

UNICEF is assisting in this service by provision of necessary equipment and books for training and supply of milk and vitamins for use in the Centres. All Centres were assisted in this manner during the year.

List below shows localities where Health Centres are operating:—

HEALTH CENTRES**Khartoum Province**

1. Khartoum
2. Goz
3. Khartoum North
4. Hay El Arab
5. Wad Nubawi
6. El Fiteihab
7. Kober
8. Halfyat El Mulouk
9. Maigoma
10. Mogren
11. Tuti

12. Higma
13. Banat
14. Burri
15. Shambat

Blue Nile Province

16. Wad Medani (a)
17. Dueim
18. Hassaheissa
19. Kosti
20. Singa
21. El Hosh

Blue Nile Province (Contd.)

- 22. El Roseires
- 23. Wad Medani (Police)
- 24. Wad Medani (b)
- 25. Rufaa

Darfur Province.

- 26. El Fasher
- 27. El Geneina

Equatoria Province

- 28. Juba

Kassala Province

- 29. Kassala
- 30. Port Sudan (East)
- 31. Port Sudan (West)
- 32. Deim Shatti (Port Sudan)

Kassala Province (Contd.)**33. Deim Arab (Port Sudan)**

- 34. Aroma
- 35. Tokar

Kordofan Province

- 36. El Obeid
- 37. El Nahud
- 38. Fellata (El Obeid)
- 39. Wad Elias

Northern Province

- 40. Atbara
- 41. Damar
- 42. Shendi
- 43. Tangassi

Upper Nile Province

- 44. Malakal

The following are ante-natal clinics where, due to shortage of Health Visitors and other trained staff, only ante-natal work is carried out :—

Wau	Burram	Berber
Kowjok	Li-Rangu	Merowe
Rumbeik	Yei	Delgo
Aweil	Maridi	Zeidab
Tonj	Kapoeta	Dongola
Sennar	Sinkat	Wad Halfa
Bakht El Ruda	Gedaref	Abri
Abu Usher	Abu Deleig	El Dakhla
Kurmuk	Um Ruaba	Darmali
Tendelti	Kadugli	Fangok
Nyala	Talodi	Bentui
Zalingei	Heiban	Bor
Lui	Abu Gebeiha	Renk
Mondri	Rigl El Fula	Nasir
Torit	Dilling	
Source Yubu	Bara.	

TABLE 31

*Activities of Maternity and Child Welfare Centres and Ante-Natal
Clinics throughout the Sudan for the Year 1962/63*

PROVINCE	No. of Clinics M.C.W. and Ante-Natal	Ante-Natal Attendances in all Clinics	No. of Home Visits	No. of Health Centres	Child Attendances in M.C.W. Centres	No. of Deli- veries by Trained Midwives
Bahr El Ghazal ..	5	7,227	—	—	—	421
Blue Nile ..	15	65,400	3,646	10	51,768	6,232
Darfur ..	5	19,176	1,736	2	17,212	2,224
Equatoria ..	9	5,231	299	1	4,877	82
Kassala ..	9	24,084	2,088	7	22,840	5,720
Khartoum	16	79,912	5,280	15	76,440	15,754
Kordofan ..	12	14,008	1,204	4	14,112	2,908
Northern ..	13	14,868	1,852	4	15,472	2,660
Upper Nile..	6	8,005	424	1	6,910	548
TOTAL ..	90	237,911	16,529	44	209,631	36,549

MEDICAL EXAMINATION OF SCHOOL CHILDREN

School Medical Service

The following Table summarises the result of Medical Examination of School Children in the Provinces:—

TABLE 32

Medical Examination of school Children 1962/63

PROVINCE	No. of Children Examined	NUMBER OF CASES FOUND					
		Trachoma	Bilharzia	Enlarged Spleen	Pulmo-Nary T.B.	Ancylostoma	All Other Diseases
Bahr El Ghazal ..	124	2	1	28	—	4	—
Blue Nile ..	31,350	1,553	942	301	—	4	22
Darfur ..	4,639	935	703	506	—	1	—
Equatoria ..	7,921	223	298	827	—	718	—
Kassala ..	21,077	2,237	90	123	—	—	—
Khartoum ..	21,751	1,376	22	25	—	—	—
Kordofan ..	14,435	2,615	696	446	—	4	244
Northern ..	30,935	6,422	783	271	—	421	1931
Upper Nile ..	2,113	77	73	105	—	2	—
T O T A L ..	134,345	15,440	3,608	2,632	—	1,154	2,197
PERCENTAGE ..	100.0	11.5	2.7	2.7	—	0.9	1.6

Mental Health

26,743 cases were seen during the year by the Psychiatrist at the Clinic for Nervous Disorders, Khartoum North; 16,131 were interviews for males and 10,612 interviews for females. 5079 were new patients, the balance representing the return attendances.

The number of medico-legal cases interviewed at Kober Institute was 629.

The Mental Diseases Board saw 27 cases during the year. The findings of the Board were as follows:—

- 9 Cases fit for Government Service.
- 5 Cases unfit for Government Service.
- 13 Cases fit for temporary service or referred for treatment and to re-appear before the Board at specified dates.

Health Education

The weekly Radio talks and Health Exhibition during tribal gatherings and agricultural shows, and press articles remained to be the media and methods for Health Education.

The audio visual aid unit in Khartoum continued its activities and is attempting to produce local films, film strips, photos, posters and models on the local health problems of the country.

CHAPTER V.**PORT HEALTH QUARANTINE**

Sea and Airports remained clear of infection during the year.

Disinfection of aircraft and quarantine control of air travellers were undertaken at Wadi Halfa, Port Sudan, Kassala, Khartoum, Juba, Malakal, Geneina, El Fasher and El Obeid.

The Aedic Index was calculated on an inspection of all habitations within the area concerned. The following table shows the aedic index throughout the year at the local airport on the international routes:—

TABLE 34

Aedes Aegypti-Index 1962/1963

M O N T H	El Fasher	Juba	Kassala	Port Sudan	Khar- toun	El Obeid	Wadi Halfa	Mala- kal
July	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0
September	0	0	0	0	0	0	0	0
October	0	0	0	0	0	0	0	0
November	0.02	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0
January	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0

Port Sudan Quarantine

Total ships inspected were 1226 of which 522 have made use of Radio Pratique System.

Suakin Quarantine

10,280 Sudanese pilgrims left for Jeddah this year; 5087 of whom left by air from Port Sudan and 5193 left by sea from Suakin.

All out-going pilgrims were compulsorily immunised against Cholera, Small-Pox and Yellow Fever.

The pilgrimage was declared by Saudi Arabia Kingdom as free from epidemic and quantinable diseases.

Khartoum North Pilgrimage Transit Camp

3866 pilgrims passed through the camp during the year and have received the necessary inoculations against Cholera and Yellow Fever and vaccinated against Small-Pox before their departure.

Medical Mission to Hedjaz

The Medical Mission consisted of three Doctors (two from Ministry of Health and one from Medical Corps), three Medical Assistants, one Store-Keeper, 13 Nurses and Midwives and two other auxiliary staff.

Treatment Centres were established at Jeddah, Mecca, Medina, Muna and Arafat. Medical Care and attention were given to all pilgrims and local inhabitants who sought for them. 23,389 patients were attended to, and 96 were treated as in-patients.

Wadi Halfa Quarantine

Examination of labourers coming from United Arab Republic was carried out before their entry into the Sudan.

494 river vessels, 436 aircrafts and 111 trains were inspected during the year 7,920 vaccinations against Small-Pox were done in the quarantine. The total number of persons who passed through Wadi Halfa Quarantine was 89,329.

Geneina Quarantine

15,237 persons passed through El Geneina Quarantine. 9,570 vaccinations against Small-Pox were done in El Geneina Quarantine.

CHAPTER VI

MEDICAL TRAINING

School of Hygiene

20 students were under training in the First Class.

Basic education requirements for entry into the School is completion of Secondary Education. The students take three years course at the end of which they must pass the Royal Society of Health Examination.

In their first year of study the students are given General Science, Building Science, Drawing and Construction Technicology, Levelling and Geometry in the Khartoum Technical Institute.

During the School vacation, the students receive a further practical rural tuition in the Provinces.

Medical Assistants Training School

33 Medical Assistants graduated from the School this year.

A new batch of 38 students were accepted in the School.

Training of Nurses

42 Hospitals are now recognized as Local Training Centres for hospital nurses

319 nurses sat for the Nursing Examination this year. 229 successfully passed the Examination; of these 157 were males and 72 were females.

Laboratory Technicians and Assistants

No new Technician trainees joined the Laboratories this year and none finished their three years course.

The Technician who had been sent to the United Kingdom returned after completion of one year's training in Laboratory Technicology. He was attached to the Lewisham Group of Laboratories.

One Laboratory Technician joined the special course in Laboratory Technicology which was arranged by the University of Beirut and the World Health Organization Regional Office at Alexandria. This course is meant to train tutor Technicians.

Another Laboratory Technician was sent to Glasgow, Scotland for further training and study in Laboratory Technicology.

25 Laboratory Assistants were trained during the year. Six for Medical Corps and the remaining civilians including one female for the Ministry of Health.

The last of the three Somali Laboratory Assistant Trainees left the country in November, 1962.

20 female students from the Nursing College Khartoum attended a course of Lectures and Practical Classes in Bacteriology, Haematology and Parasitology.

The Police Cadets from the Police College Khartoum, were given lectures and practical training on Forensic Medicine. A total of 25 lectures were given.

Dispensers Training School

The curriculum of the course includes recapitulation of Basic Science, *i.e* Elementary Chemistry, Elementary Physics and Biology. Stress is made on. Practical Dispensing and Pharmaceutics.

34 Dispensers were graduated till now and they are filling posts in the big hospitals.

The total number of Students in the School at present is 6 including one from Somalia on a World Health Organization Fellowship.

Training of Radiographers

9 candidates were taken for training in 1962/1963 including one from Yemen on a World Health Organization Fellowship.

The School of Radiology gives a Course of Training for two years for candidates of School Certificate level.

Theoretical teaching is given in Electricity, Photography, Anatomy, Nursing as well as in Radiographic methods and practice. All allied fields of study are dealt with according to their degrees in connection with Radiography.

Practical Radiography, Dark Room Practice and the practical handling of machines, X-Ray hazards and all allied subjects are dealt with.

Eye Hospital — Khartoum

Students for the School had been selected from the Certificated Mumarids (Rais Anbar or Wakil Rais Anbar Status). The duration for study in the School is two years. The students have studies in Eye Diseases, Elementary Anatomy and Physiology, and Diseases which have an effect on the eye.

So far 32 Ophthalmic Assistants were graduated.

9 students are at present in the School.

Training of Other Staff

The School Training of Higher Nurses and Dental Assistants is mentioned under the World Health Organization Assisted Projects.

The Training of Midwives and Health Visitors is mentioned under the Chapter of Social Hygiene.

EXISTING HOSPITALS, DISPENSARIES AND DRESSING STATIONS AVAILABLE 1962/1963

TABLE 34

Province	Hospital (67)	BEDS IN HOSPITALS						Dispen- saries	Beds in Dispen- saries	Total Beds in Hospitals and Disps.	Dressing Stations	Popu- lation	Beds per 1,000 Popu- lation in Hospitals and Disps.						
		General	T.B.	Child- ren	Mater- nity	Total													
ahr El Ghazal	Wau ..	204	86	8	9	307)	16	149	743	51	1,293,000	0.57							
	Rumbeik ..	111	48	—	—	159)													
	Aweil ..	48	—	—	—	48)													
	Raga ..	40	—	—	—	40)													
Tonj ..	40	—	—	—	40)														
		443	134	8	9	594													
Blue Nile ..	Wad Medani ..	354	120	69	54	597)	145	94	1,957	171	2,583,000	0.76							
	Rufaa ..	100	—	—	—	100)													
	El Dueim ..	98	16	—	16	130)													
	El Geteina ..	60	—	—	—	60)													
	Abu Usher ..	180	40	—	14	234)													
	El Huda ..	12	—	4	4	20)													
	Sennar ..	156	—	—	—	156)													
	Singa ..	130	54	—	10	194)													
	Kosti ..	152	—	—	16	168)													
	El Roseires ..	102	—	—	8	110)													
	El Kurmuk ..	94	—	—	—	94)													
		1,438	230	73	122	1,863													
Darfur	El Fasher ..	176	40	10	20	246)	45	498	1,183	40	1,625,000	0.73							
	Nyala ..	95	7	2	4	108)													
	Geneina ..	110	10	—	—	120)													
	Zalingei ..	67	8	—	4	79)													
Daein ..	68	—	—	4	72)														
Buram ..	56	—	—	4	60)														
	572	65	12	36	685														
Equatoria ..	Juba ..	269	71	37	39	416)	41	432	1,601	51	1,110,000	1.44							
	Lui ..	45	8	3	4	60)													
	Maridi ..	101	19	—	9	129)													
	Li-Rangu ..	110	29	—	10	140)													
	Sources Yubu ..	115	—	—	6	121)													
	Yei ..	65	14	—	4	83)													
	Torit ..	123	10	—	1	134)													
	Kapoeta ..	60	16	10	—	86)													
		888	158	50	73	1,169													
	Kassala ..	Kassala ..	251	48	20	20							339)	51	202	1,378	61	1,212,000	1.14
		El Gedaref ..	198	24	12	4							238)						
		Aroma ..	100	—	—	—							100)						
Port Sudan ..		249	68	23	26	366)													
Toker ..	73	—	—	—	73)														
Sinkat ..	60	—	—	—	60)														
	931	140	55	50	1,176														
Khartoum ..	Khartoum ..	690	—	122	50	862)	33	45	2,088	23	633,000	3.30							
	Tawra and Abu ..	—	401	24	—	425)													
	Anga ..	292	—	60	—	352)													
	Omdurman ..	146	—	42	20	208)													
Khartoum North ..	108	—	10	—	118)														
Eye Hospital ..	30	—	10	—	40)														
Abu Deleig ..	—	—	—	38	38)														
Omdurman Mater- nity Hospital ..)	—	—	—	—	—														
	1,266	401	268	108	2,043														
Kordofan ..	El Obeid ..	274	60	25	25	384)	67	700	1,801	73	2,196,000	0.82							
	Kadugli ..	129	8	—	3	140)													
	Abu Gebeiha ..	96	—	4	—	100)													
	El Dilling ..	77	8	8	7	100)													
	Talodi ..	49	13	—	2	64)													
	El Nahud ..	110	10	9	—	129)													
	Rigl El Fula ..	44	—	—	2	46)													
	Bara ..	39	—	—	1	40)													
	Um Ruaba ..	93	5	—	—	98)													
		911	104	46	40	1,101													
	Northern ..	Atbara ..	217	36	16	19							288)	73	97	1,179	93	1,066,000	1.11
		Halfa ..	120	46	22	14							202)						
Shendi ..		58	—	8	2	68)													
Dongola ..		65	12	1	8	86)													
Berber ..		86	—	10	4	100)													
Merowe ..		69	6	8	—	83)													
Borgeig ..		50	—	10	—	60)													
Delgo ..		50	—	15	10	75)													
Abu Hamad ..		52	—	—	8	60)													
El Zeidab ..		44	—	10	6	60)													
		811	100	100	71	1,082													
Upper Nile ..		Malakal ..	207	83	22	16	328)	37	258	836	29	1,112,000	0.75						
	Bor ..	100	—	—	—	100)													
	El Renk ..	68	—	—	—	68)													
	Bentui ..	75	1	6	—	82)													
	450	84	28	16	578														
TOTAL ..		7,710	1,416	640	525	10,291	508	2,475	12,766	592	12,830,000	0.99							

The ratio for Hospital Beds only is 0.80 per 1000 population.

CHAPTER VIII
ANNUAL REPORT 1962/63
of the
STACK MEDICAL RESEARCH LABORATORIES
FOR THE PERIOD
From 1.7.1962 To 30.6.1963

By
DR. M. H. SATTI

This report covers the period from July 1st. 1962 to June 30th. 1963. During this period research has been carried out on Kala-Azar, Onchocerciasis, Scorpion venom and Jaundice, mainly infective hepatitis, etc. Summaries of these and other subjects will be found under the appropriate headings.

A great part of the time of the Staff was spent on teaching the technicians, female nurses from Khartoum Nursing College, Police Cadets and Laboratory Assistants.

Among visitors to the Laboratories were Prof. T. F. Hewer, Professor of Pathology in the University of Bristol, Dr. W. Lathem from the National Institute of Health, Bethesda U.S.A., Dr. Tania Kouznestova from the Eastern Mediterranean Regional Office of World Health Organization, Prof. B. Mc Millon of the School of Public Health and Tropical Medicine, Sydney, Australia, Dr. P. W. Hutton of the Royal College of Physicians, England and Mr. H. Izant, Chief Libraries and Reference W.H.O. H.Qrs. Geneva.

None of the staff went out of the Sudan to attend conferences and none went visiting other institutions and laboratories. It is felt that this is essential if the staff are to keep abreast with the latest developments in research in the various fields of medicine.

STAFF CHANGES

Dr. Mansour Ali Haseeb left the Directorship of these Laboratories on 1.4.63 and took the Chair of Bacteriology in the Faculty of Medicine, University of Khartoum.

Dr. Mahmoud A/Rahman Ziada returned on 22.11.62 from U.K. and took over the Blood and haematology work.

Dr. Miodrag Mutavdzic of Yugoslavia has joined the Laboratories as a Pathologist in February, 1963.

During the year two Pathology Registrars, Drs. Ahmed Mahmoud Abbas and Abu Bakr Hassan Amin were sent to Britain for further study and training in Pathology and Bacteriology.

At the same time Drs. Rashed El Amin and Hassan Sid Ahmed were taken as Registrars in the Laboratories. The former later left us and joined the University of Khartoum as Registrar in Pathology.

Two new Registrars had been selected. One of these is Dr. Hassan Sherif, who has been taken as Parasitology Registrar and will now work in collaboration with the Kala-Azar team of Namru 3 at Malakal.

Two B.Sc. Science Students had been taken for the Medical Zoology and endemic diseases department. One is to train as a Malacologist, while the other is now attached to the W.H.O. Malaria team to train as Medical Entomologist. Several B. Sc. Science graduate posts have already been approved for this section of the laboratories. One for animal ecology, to study animals populations, habits, etc. in relation to human disease and to control their numbers. Another graduate is to train as Malacologist to take charge of the work outside the Gezira.

Four Science graduates posts for Kala-Azar, Malaria, Onchocerciasis and Trypanosomiasis had been approved.

Expansion in the laboratories is being slowly but surely planned.

EDUCATION AND ROUTINE ACTIVITIES

Now new technicians trainees joined the laboratories and none finished their three years course and became qualified Lab. technicians.

Laboratory Technicians Abdel Rahman Abu Gasim returned from U.K. after one year's training in Laboratory Technology. He was attached to the Lewisham Group of Laboratories.

Lab. Technician Mudather Babiker joined the special course in Laboratory technology which was arranged by the University of Beirut and the World Health Organization Regional Office at Alexandria. This course is meant to train tutor technicians.

Lab. Technicians Beshir Mohammed Ahmed was sent to Glasgow, Scotland for further training and study in Laboratory technology.

25 laboratory assistants were trained during the year. Six for Medical Corp and the rest civilians including one female for the Ministry of Health.

The last of the three Somali Laboratory Assistant trainees left during November, 1962.

20 female students from the Nursing College Khartoum attended a course of lectures and practical classes in Bacteriology, Haematology and Parasitology.

The Police Cadets from the Police College Khartoum, were given lectures and practical training on Forensic Medicine. A total of 25 lectures were given.

Routine Work

A summary of the routine work and research carried out during the year is appended to this report.

The total number of examinations was 49,792 compared to 48,489 in the previous year and 44,920 in 1960/61.

The demand for all three vaccines, Small-pox, Rabies and T.A.B. has increased tremendously. The dried small-pox vaccine is now produced on a small scale.

Anti scorpion serum, on a small scale, was produced last year but it was considered advisable to wait until fully qualified staff are recruited and trained to do this job. Arrangements are well on the way.

Forensic Medicine

Dr. Haseeb gave lectures and demonstrations on Forensic Medicine to the students of the Faculty of Medicine, University of Khartoum and also to the Police Cadets. In the teaching of Police Cadets he was helped by Doctors Satti and Rasheed.

In view of the increase of the Medico-legal work, it is considered imperative that new recruits to do the forensic work be employed forthwith. Of late the volume of work has increased tremendously and necessitates urgently the recruitment of additional personnel to cope with it. These will undergo their training now and to be ready when the building for the Sudan Institute for Medical Research are completed. The building of the Institute is going on satisfactorily.

Lymph Vaccine

The Lymph vaccine issued during the year was 1,334,900 doses compared to 2,500,000 doses last year. This is because of the increased use of the imported dry lymph vaccine.

Lymph Vaccine Preparation

During the year under review 122 sheep were used and produced 7,842 gram of pulp with an average of 64 grams per sheep. This vaccine was enough to vaccinate 5,113,450 persons. The vaccine bulk is still of the glycerinated type.

EXPERIMENTAL ANIMALS

Bush babies

A colony of bush babies has been started in the Stack Laboratories. These are Lemuridae that have nocturnal habits. They are found in the Nuba Mountain and the Southern part of Darfur (Nyala District). They are known to be Savannah apes.

The type that exists in the Sudan is the small bush-baby (*Galago senegalensis*). These lemuridae are known to be reservoirs of yellow fever. The reason why this colony has been started will appear under Kala-Azar research.

Hamsters

An attempt to start a colony of hamsters has failed. This is ascribed to the fact that hamsters are cold climate species and therefore cannot survive the hot tropical climate of Khartoum. They need air conditioning and meticulous care that we cannot afford to give at the present time. This is mainly because of expense.

It is understood that at least one previous attempt to breed these animals in the Stack Laboratories was also doomed to failure.

Monkeys

The grivet monkey (*Cercopithecus aethiops*) has been one of the laboratory experimental animals in the Stack Laboratories for more than thirty years. It never bred in captivity in these Laboratories. But last year an opportunity presented itself for a male and female to occupy one big cage that used to be full of other monkeys and consequently the female became pregnant and gave birth to a young baby. This is the first time this occurred in the history of these Laboratories.

POLIOMYELITIS VACCINE

Dr. D. Ikic, Director, Institute of Immunology, Zagreb, Yugoslavia was very kind to offer 100,000 doses of Poliomyelitis Oral vaccine for a mass vaccination campaign against polio.

The mass campaign against poliomyelitis with the new Polio oral vaccine was carried out by the Medical Corps and the P.M.O.H. Khartoum Province

O.C. Medical Corps reports that this vaccine gave good result as the number of cases of colds and tonsillities in children, who have been vaccinated against the disease has been reduced to a minimum. No untoward effects were reported. The number was very small.

The following is the number of the children and the dates of the administration of the three types vaccine:—

90	children	from	6	months	to	9	years	—1st.	dose	on	26/1/63
	„	„	„	„	„	„	„	—2nd	„	„	26/2/63
	„	„	„	„	„	„	„	—3rd.	„	„	26/3/63
70	„	„	„	„	„	„	„	—1st.	„	„	2/2/63
	„	„	„	„	„	„	„	—2nd.	„	„	2/3/63
	„	„	„	„	„	„	„	—3rd.	„	„	2/4/63
45	„	„	„	„	„	„	„	—1st.	„	„	6/2/63
	„	„	„	„	„	„	„	2nd.	„	„	6/3/63
	„	„	„	„	„	„	„	—3rd.	„	„	6/4/63

The vaccine is of high potency.

The P.M.O.H. Khartoum Province reports the following observations:—

It is regretted that the oral vaccination did not proceed according to plan, partly because the parents did not bother to bring most of those who had the first dose and partly because of failure of co-operation of those concerned. It appears that the P.M.O.H. Khartoum authorities had not enough staff and facilities to carry out this job.

This vaccine loses potency very readily and it is a pity that still big stocks are held here and in the stores.

We cannot use it before we know that it is potent. Arrangements are being made to send samples for potency testing by Dr. Ikic of Yugoslavia.

Dr. Khalda Zahir working under the P.M.O.H. Khartoum reports certain symptoms that she attributes to the vaccine.

These were:—

- (a) 2 children under one year who developed diarrhoea 2nd. day after the vaccination
- (b) One child had fever for one day and was all right.
- (c) One child of two years developed Urticaria after the 1st. and 2nd. dose and was better the 2nd. day.
- (d) One child had fever and paresis of a lower limb. His mother took him to the doctor. The child improved and had no further complication.

The Pathologist reports that the number of specimens received by the department during the period under review is very similar to that of the previous year. Even in the malignant tumour the figure is about the same.

Total biopsy specimens	..	..	..	..	1,708
Neoplastic Diseases	..	..	..	..	475
Malignant tumours	..	..	..	..	199
Benign tumours	..	..	..	..	276

Analysis from above figures:—

Malignant Tumours

Classification							Total No.
Group	I	Squamous Carcinoma	..	..	..	..	57
„	II	Glandular Carcinoma	..	..	..	..	30
„	III	Sarcoma	..	..	..	..	18
„	IV	Lmphoma and Vascular Tumours	..	..	..	..	17
„	V	Adamantinomas and Teratoid Tumours	..	..	..	..	10
„	VI	Melanoma and Retinoblastoma	..	..	..	..	13
„	VII	Secondary and Undifferentiated Tumours	..	..	..	..	12
„	VIII	Boderline tumours and Carcinoma in situ	..	..	..	..	42
		Total Malignant Tumours	..	..	..	..	199

ANATOMICAL LOCATION OF MALIGNANT TUMOURS

1.	Lymphatic and Vascular	..	..	..	..	..	15
2.	Respiratory tract	..	..	..	..	..	8
3.	Upper digestive tract	..	..	..	..	..	9
4.	Lower digestive tract	..	..	..	..	..	13
5.	Abdominal cavity	..	..	..	..	..	10
6.	Urinary and Male genital organs	..	..	..	..	..	15
7.	Female genital tract	..	..	..	..	..	46
8.	Musculo-skeletal system and eyes	..	..	..	..	..	25
9.	Special glands and endocrine glands	..	..	..	..	..	40
10.	Organs not specified	..	..	..	..	..	18
TOTAL							199

GYNAECOLOGICAL PATHOLOGY

(Out of the total biopsy specimens)

Total gynaecological specimens	531
Total endometrial curettings	358
(of the total gynae. specimens)	

Out of 531 endometrial specimens examined, 348 were found to show endometrial phase disturbance either associated with sterility or profuse bleeding in Metropathis.

FORENSIC SEROLOGY SPECIMENS

Forensic serology specimens (blood and seminal stains) examined in this department reached a total of 144 specimens.

Blood stains	..	..	..	..	..	..	..	..	16
Seminal stains	..	..	..	..	..	..	..	..	98
									—
TOTAL	..	..	..	..	..	..	..	..	114

RABLES

452 brains were received of which 25 were decomposed and useless for examination;of the remaining 39 were pcsitive for Negri bodies. This compares with 5lpositive of 285 brains received during the last year.

The species of animal infection and the distribution of positives and negatives in the year is shown in the following table:—

TABLE
RABIES

A N I M A L					Positive	Negative	Decomposed	Total
Dog	..	..	..	..	38	292	20	350
Camel	..	..	..	..	—	—	—	—
Donkey	..	..	..	..	—	23	2	25
Cat	..	..	..	..	1	17	—	18
Cow	..	..	..	..	—	11	3	14
Goat	..	..	..	..	—	34	—	34
Monkey	..	..	..	..	—	9	—	9
Tiger	..	..	..	..	—	—	—	—
Wolf	..	..	..	..	—	—	—	—
Unknown	..	..	..	..	—	2	—	2
T O T A L					39	388	25	452

KALA—AZAR

Research in Kala-azar is continuing. Besides, the work going on in Malakal and Paloich mainly carried out by the Namru 3 Subunit, some studies are going on in these laboratories and some clinical material of great interest is from time to time encountered in the Khartoum Civil Hospital.

A series of papers had been published by Namru 3 staff mainly dealing with epidemiology with particular reference to the sandfly as a vector.

Infections in P. orientalis as well as in certain types of rodents. Hoogstraal et al (1963) (American Journal of Tropical Medicine) Vol. 2 No. 2 pp. 175 — 178 reports as follows:—

“Infections identical with L. donovani on the basis of appearances in cultures and pathogenesis in hamsters were recovered from 2 rodents Rattus rathus and Acomys spp., trapped in Malakal town, Upper Nile Province. It appears that a rodent-sandfly-rodent cycle of leishmaniasis occurs in this town, but that in the absence of man-biting sandflies, humans do not become infected in this urban centre.

In Paloich District, approximately 100 miles from Malakal, 2 definite and 2 equivocal *Leishmania* infections were found among 117 Nile Grass Rats (*Avicantis niloticus luctuosus*) out of a total of 242 wild rodents from this district. These were isolated by hamster inoculation and one (equivocal) by direct culture of spleen tissue. These animals were trapped in an area where human kala-azar is endemic and in the same acacia forests where *Phlebotomus orientalis* was found to bite man and to be commonly infected with *Leishmania*".

SUDANESE TEAM

A nucleus of a Sudanese team for the kala-azar research is already starting by the appointment of Dr. Hassan Sherif as a Parasitology Registrar and to be attached to the Namru 3 Subunit as a co-worker for a training in research work.

A second Parasitology Registrar is required as well as Laboratory Technicians and hunters for the study of animal zoonosis in connection with leishmaniasis. This team is required to be a complete self-contained unit to continue work of a research nature from the point of view of Clinical, Pathological, Parasitological aspect of this disease. They will be reinforced with the services of an entomologist whenever one is available.

In addition the scope of their research work will entail, reservoir hosts, vectors, and other methods of transmission as well as further study on treatment. Pentavalent antimony compounds (Pentostam) and the diamidines and any new drugs like Amphotericin B., etc.

It has to be emphasised that kala-azar is spreading to new areas particularly in Kordofan — Eastern District of the Nuba Mountains and West bank of the White Nile. These areas are contiguous.

In the Sudan Medical Journal, Sati (1962) (S.M.J. Vol. 1 No. 2 New Serie pp. 98—111) described the Early phases of an outbreak of Kala-Azar in the Southers Fung.

The Summary of this Paper is as follows:—

- (1) "A violent outbreak of Kala-Azar broke out in the Southern Fung in 1956 It was the first epidemic of its kind in the Sudan, as it struck a virgin soil. The morbidity rate as well as death-rate were high before mass treatment was started.
- (2) The disease affected and hit hard a small tribe, the Jum Jum who live in and around Wadeka in the Southern Fung.
- (3) The disease had been imported from the Northern Fung by the nomadic Arabs of Rufaa Elhoi tribe and the Jum Jum shepherds who were employed by them from Singa District, from round Mazmoom and Dali.
- (4) Economic development in the Northern Fung had attracted many non-immunes and therefore the infection increased. As development had been gradual the incidence had slowly been rising and therefore did not capture sight.
- (5) Previous to this there were reports of flare up of small outbreaks of cases in military patrols and posts, *e.g.* in Kurmuk, Jongols post, Wad Arud and Lokiotang area. The only sudden and violent outbreak besides these was in Mellut in 1939 and reported by Stephenson in 1940; the number involved was small.

- (6) Although the sandfly had been incriminated as a vector of Kala-azar in India, it is also suggested that it plays an important role here but it is deemed that it is not the whole story. Other methods of transmission should be taken into consideration and looked into. Other insect vectors are suggested.
- (7) The flare up of the disease particularly the latent stage in vertebrates as a result of stress due to sudden climatic variations like floods had been alluded to. This state of affairs is considered important in the flare up of outbreaks like Kala-azar and Yellow fever.
- (8) Difficulty of diagnosis had been shortly discussed and investigations carried out referred to. The evidence, in favour of diagnosis of Kala-azar had been adduced. The safety of spleen puncture in experienced hands has been reported.
- (9) A few cases were found to give a positive Weil Felix reaction. The fact that this test is found positive in conditions other—than typhus was reported ”.

JNEW EXPERIMENTAL HOST FOR LEISHMANIASIS

SATTI (1963) (Experimental Parasitology in the Press) has discovered a new experimental host for leishmaniasis which if not better than is as satisfactory as the hamster. This animal is the bush-baby (*Galago senegalensis senegalensis*) This is one of the lemuridae that are commonly found in the Savannah region of the Sudan.

JAUNDICE (Infective Hepatitis)

Satti, Haseeb and Halim (1962) (S.M.J. Vol. 1 No. 3 pages 146-156) reported on some cases of jaundice in Gedaref. The summary of this study is as follows:—

- (1) In July, 1957, a small outbreak of jaundice occurred in Gedaref. The total number of cases is not known but 37 cases were admitted to hospital. These constituted the subject of this study.
- (2) Six cases of these developed coma of whom 5 died. Liver sections were secured from two cases that died and both showed the histopathology of massive necrosis, which as a rule complicates cases of infective hepatitis. One case completely recovered, surviving the hepatic coma. It should be stressed that none of these cases received corticosteroids or neomycin. One case had a black vomit.
- (3) The mortality rate amongst these cases is therefore about 13.51 per cent.
- (4) Those affected are mainly Westerners who come for employment, in the rain cultivations and are mainly young adults.
- (5) The disease was showing the typical gastro-intestinal prodromata that are usually encountered in infective hepatitis.

- (6) Out of forty blood sera from healthy young school children examined, one was found to have protective anti-bodies for yellow fever. Four others gave doubtful results.
- (7) Environmental health conditions were far from satisfactory and had been referred to, with particularly high population of house flies. Water and milk supply has been alluded to. The raising of the standard of the general environmental sanitation is indicated and considered urgent. This is important in view of the rapid development in the mechanised Crop Production in the rain cultivations in Gedaref Area.

Satti, Halim and Haseeb (1962) (S.M.J. Vol. 1 No. 4 pages 200-206) studied some jaundice cases in Khartoum Civil Hospital during an outbreak of infective hepatitis. Hereunder is a short summary of this study.

“139 cases of jaundice in Khartoum have been analysed. In the analysis it has been shown that the disease affects the young adults and declines at the extremes of age. In this outbreak more males were affected than females, but probably this is due to the fact that the section studied consisted of more males than females of hospital cases. In a sample of 65 cases, about 50 per cent had no family contacts and were presumably infected from the general population. Analysis of cases showed that the low-socio-economic group suffered most and formed the bulk of the cases. Out of 51 cases randomly selected, 92 per cent consisted of this group. The mortality rate for the whole group is 15.1 per cent. All the deaths occurred after the development of coma. Out of 41 cases of coma, 20 recovered. The mortality rate for the coma cases was 51.21 per cent. The liver unction tests performed confirmed the acute hepatitis nature of the disease”.

EXPERIMENTS WITH CORTISONE

Satti and Haseeb (1962) (S.M.J. Vol. 1 No. 3 pages 138—142) carried out experiments on mice and rats in connection with the effect of cortisone on the shortening of the incubation period of rabies fixed virus and the reactivation of a latent infection as a result of its administration.

The summary is as follows:—

“Experiments in mice and white rats in the study of certain aspects of rabies fixed virus showed that the administration of cortisone shortened the incubation period of rabies fixed virus in these animals. Cortisone alone also flared up a latent or inapparent infection in them and resulted in their death in a matter of a few weeks.

It is suggested that stress in nature may be the trigger mechanism of the break out of a violent epidemic disease by provoking a zoonosis to start with in animal reservoir hosts. The stress can be visualised to start as a result of certain ecological conditions of the vector or reservoir host causing the wide-spread dissemination of the disease in animals and later in humans. Stress in the humans had been observed to evoke a latent infection. Stress as a cause of the release of cortisone is well-known.”

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KHAN TESTS

							Positive	Negative	TOTAL
July 1962	..	..	..	..	..	..	124	1180	1304
August	..	..	..	..	..	..	115	903	1018
September	..	..	..	..	..	..	102	856	958
October	..	..	..	..	..	..	102	809	911
November	..	..	..	..	..	..	100	929	1029
December	..	..	..	..	..	..	98	887	985
January 1963		..	..	..	..	..	100	989	1089
February	..	..	..	..	..	..	69	544	613
March	..	..	..	..	..	..	124	932	1056
April	..	..	..	..	..	..	71	798	869
May	..	..	..	..	..	..	88	775	863
June	..	..	..	..	..	..	76	863	939
T O T A L	..	..	..	..	..	..	1169	10,465	11,634

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	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
WIDAL REACTION													
T.	55	77	23	95	42	57	57	30	26	6	—	6	474
A.	2	5	10	2	15	8		—	10	12	3	12	86
B.	2	4	9	11	16	8	12	2	7	7	13	13	104
M.	—	1	2	6	4	7	5	3	6	—	3	2	39
Negative	306	372	257	445	229	582	626	293	514	332	292	369	4,617
TOTAL	365	459	301	559	306	662	707	328	563	357	311	402	5,320

BLOOD CULTURES

T.	26	20	30	26	39	50	56	22	35	42	26	49	421
A.	2		11	1	4	7	4	1	9	12	9	14	74
B.		1		1	2								4
M.				1	1								2
O.C.		16			1	5		2	16	13	11	12	81
Streps				1	1	2	4	4	2	12	7	6	47
Sterile	61	100	108	140	160	240	133	195	130	134	125	182	1,708
Contaminated	60	102	112	130	140	220	123	160	90	85	63	94	1,379
TOTAL	149	239	274	300	348	524	320	384	282	298	241	357	3,716

MALARIA

[illegible]

K.A.	..	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
R.F.	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Blood Counts	..	30	30	35	38	30	40	28	35	22	31	42	20	381	—	—	—	—	—
Weil-Felix	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Positive	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Negative	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	..	30	31	35	38	30	40	28	35	22	31	42	20	382	—	—	—	—	—
GRAND TOTAL	..	570	753	640	914	699	1,236	1,075	770	882	706	615	814	9,674	—	—	—	—	—

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FAECES

	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Flexeneri ..	11	13	3	7	6	1	6	2	2	—	5	1	57
Shiga ..	2	2	4	2	1	—	2	—	1	—	3	2	19
B. Alkalesc ..	—	—	—	—	—	—	—	—	—	—	—	—	—
Ambigium ..	—	—	—	—	—	—	—	—	—	—	—	—	—
Sonne ..	1	—	1	3	—	—	8	—	1	—	—	—	14
T. ..	4	14	17	18	26	18	—	—	5	9	3	6	120
A. ..	3	2	3	1	—	1	—	—	—	—	—	—	10
B. ..	2	2	1	—	—	1	—	—	—	—	1	4	11
Amoeba ..	—	—	—	—	—	—	2	—	—	1	—	—	3
Ova ..	—	—	—	—	—	—	1	—	—	—	—	—	1
Negative ..	407	295	342	400	495	269	430	203	369	329	369	387	4,295
TOTAL ..	430	328	371	431	528	290	449	205	378	339	381	400	4,530

URINE

	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Totol
T.	2	4	—	—	—	—	—	—	—	—	—	—	6
A.	1	1	—	—	—	—	—	—	—	—	—	—	2
B.	—	—	—	—	—	—	—	—	—	—	—	—	—
M.	—	—	—	—	—	—	—	—	—	—	—	—	—
Ova	—	—	—	—	—	—	1	—	—	1	—	1	3
Negative	770	656	670	721	800	586	739	625	447	548	554	615	7,731
TOTAL ..	773	661	670	721	800	586	740	625	447	549	554	616	7,742
GRAND TOTAL ..	1,203	989	1,041	1,152	1,328	876	1,189	830	825	888	935	1,016	12,272

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	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Positive C.S. Fluids..	1	—	—	—	—	2	—	—	1	—	1	—	5
Negative ..	28	32	12	118	13	14	12	14	15	20	16	12	306
Positive ..	9	23	25	20	21	9	4	6	1	3	2	2	125
C. Diph. Negative ..	112	212	145	172	185	154	147	104	148	97	100	106	1,682
Positive ..	5	4	9	5	6	30	6	6	2	3	4	6	86
Sputum Negative ..	60	35	25	54	58	100	55	150	34	50	64	70	755
General Bact. ..	406	486	626	490	424	375	404	249	513	420	459	511	5,363
Biochem. ..	510	450	600	500	550	450	610	580	510	410	532	989	6,691
TOTAL ..	1,131	1,242	1,442	1,359	1,257	1,134	1,238	1,109	1,224	1,003	1,178	1,696	15,013

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SUMMARY OF LABORATORY EXAMINATIONS

MONTH			Khan Tests	Blood	Faeces and Urine	Gen. Bact and Biochem.	Histology	TOTAL
July 1962	..	..	1304	570	1203	1131	187	4395
August	..	..	1018	753	989	1242	83	4085
September	..	..	958	640	1041	1442	111	4192
October	..	..	911	914	1152	1359	118	4454
November	..	..	1029	699	1328	1257	76	4389
December	..	..	985	1236	876	1134	109	4340
January 1963	..	..	1089	1075	1189	1238	129	4720
February	..	..	613	770	830	1109	106	3428
March ..	..	..	1056	882	825	1224	133	4120
April ..	..	..	869	706	888	1003	149	3615
May ..	..	..	863	615	935	1178	250	3841
June ..	..	..	939	814	1016	1696	257	4722
TOTAL	..	..	11,643	9,674	12,272	15,013	1,708	50,301

Rabies Examinations—

Positive	..	..	..	39
Negative	..	..	..	388
Decomposed	..	..	..	25
TOTAL	..	..	..	452

Vaccine issued during 1962/63—

Anti Rabie	..	..	..	..	128,300 ml.
T.A.B.	..	..	..	..	847,330 ml.
Staphylococcus Aureus	..	..	..	..	2,250 ml.
Doses of Lymph Vaccine	..	..	..	..	1,334,900 ml.
Cholera Vaccine	..	..	..	..	38,500 ml.

LIST OF PUBLICATIONS DURING THE YEAR BY MEMBERS OF THE STAFF

APPENDIX 'O'

Name and Initials of Author	Date of Publication	Title of Article	Title of Journal in which Published	Volume Number of Journal	Page No. of Journal
1. Satti, M.H., and Haseeb, M. A.	September, 1962	Effect of Cortisone on Resistance, its reactivation of latent infections and Suggested Role in Sudden Appearance of Epidemic.	Sudan Medical Journal	Vol. 1 No. 3	Page 138-142.
2. Haseeb, M.A.	September, 1962	Observation on An Outbreak of Small Pox at Meseiktab	Sudan Medical Journal	Vol. 1 No. 3	Page 143-145.
3. Satti, M.H., Haseeb, M.A., and Halim, M.A.	September, 1962	Studies on Jaundice in the Sudan Republic Part I Report on Cases of Jaundice in Gedaref.	Sudan Medical Journal	Vol. 1 No. 3	Page 146-156.
4. Satti, M.H., Halim, M.A. and Haseeb, M.A.	December, 1962	Studies on Jaundice in the Sudan Republic Part II. Jaundice in Khartoum	Sudan Medical Journal	Vol. 1 No. 4	Page 200-206
5. Satti, M.H.	December, 1962	Viral Hepatitis Editorial	Sudan Medical Journal	Vol. 1 No. 4	Page 210-215.
6. Satti, M.H.	December, 1962	Leishmanial Enteritis as a Cause of Intractable Diarrhoea and Death.	Sudan Medical Journal	Vol. 1 No. 4	Page 216-218.

ANNUAL REPORT OF THE SECTION OF MEDICAL ENTOMOLOGY

FOR THE YEAR 1962—63

The work during the year also continued on the following lines as in the past :—

- (1) Identification of adults and larvae received at the Section.
- (2) Collection and identification of Phlebotomine sandflies.
- (3) Identification of all insects of medical importance received from different parts of the country.

Besides the above the following special surveys were made :—

- (i) A large collection of sandflies was raised from Jebelein Tozi, El Eilafon, and Khashm el Girba. A major portion of this collection was identified, the details of which are given in Appendix B.
 - (ii) A collection of mosquitoes was raised from Kadugli in Kordofan province
 - (iii) In view of the great importance of the place due to the resettlement of the displaced people from Halfa, the Medical Entomologist visited Khashm el Girba to study the Anopheline Fauna with special reference to malaria, since in the previous collections from the area it was noted that *Anopheles gambiae* bred there almost round the year.
 - (iv) At the request of the Under-Secretary, Ministry of Health the Medical Entomologist also accompanied a group of doctors and specialists who visited Port Sudan in March to investigate into the causes of a severe outbreak of Jaundice there following an unusually heavy winter rainfall. Another object of the visit was also to examine the high incidence of biting Culicine mosquitoes and to suggest control measures which are described in detail in the following pages.
- (4) Studies on *Simulium damnosum* continued in the Northern Province with a view to obtaining data for planning control of the pest by treatment of Nile with some insecticide a suitable time of the year.
 - (5) Studies on the laboratory bionomics of the common mosquitoes continued in the Section.
 - (6) A special problem of research was taken up and pursued viz, to obtain the base line data in terms LC50's and LC90's of various Chlorinated Hydrocarbon and Organ phosphorus compounds in the laboratory for Phlebotomous. In view of the difficulties involved in raising laboratory colonies of *Phlebotomous* it is extremely difficult to have sufficient numbers for tests. We have, therefore, to depend on the daily collections made in the field. This renders this type of research very slow. Hence there are hardly any previous records of these figures for the insect. It is proposed to determine the susceptibility levels of the common species *P. papatasi* with the help of the W.H.O. kit improvised for the purpose. This work, when completed, will be of much practical value, as it will provide basis for comparisons and measuring the resistance of *Phlebotomus* to insecticides in this country and other parts of the world, where this species occurs. So far LC50's for six different insecticides have been determined.

Now some details are provided in the following of the work on different families of insects.

Culicidae (Mosquitoes) Mosquitoes collected by the Section and those sent by the health workers in the provinces were identified that are listed in Appendix A. The mosquitoes belonged to 4 Genera viz. *Anopheles*, *Aedes*, *Culex* and *Mansonia* and some different Subgenera which are *Anopheles*, *Lutzia*, *Culiciomyia*, *Stegomyia*, *Aedimorphus*, and *Mansonioides*. They account for 14 species.

Port Sudan

Twelve different places most of them, Deims were inspected in Port Sudan for mosquito breeding. Of all the various possible breeding places in the area, the soak-away wells of the Aqua privies, both in the town itself and in the deims, were found to be breeding grounds of *Culex pipiens fatigans*. This sub-species, as is well known is the anautogenous man-biting member of the *pipiens* complex. The other sub-species of the complex viz., *molestus* and *pipiens* are also known from the Sudan. Ever since the introduction of the aqua privies with the soak away wells, the incidence of this vicious biting species has become very extensive. These wells all over the area were found teaming with the larvae, pupae and newly hatched adults of the mosquito. The wells inspite of being closed with a heavy iron lid are reached by the female that enters it through the vent pipes which were covered, formerly with metal gauze and now with cloth or jute gunny bag rags. It is recommended that the wells, that are at present treated with oil, should be treated with DDT in oil to give a 0.1 ppm solution. This should be applied after clearing the scum as far as possible. In order to obtain this concentration, it is recommended that one ounce of P'P'' DDT be added to 20.5 ounces of Diesel Oil and each well be treated with approximately 1.3 ounces of this solution. This dosage was calculated as follows :—

Capacity of a soak Away Well	..	..	..	18	Cubic Metres
				= 18 x 219	Gallons
				= 39420	lbs.
0.1 ppm. DDT	..	..	..	0.04	lb. approx.
5.0 per cent Solution in Oil	..	..	..	0.004	lb. of DDT in
				0.008	gallons.

Khashm el Girba. Ever since it was known that a dam was to be constructed on the Nile near Khashm el Girba and the displaced people from Wadi Halfa were being resettled there, this Section started collecting insects of medical importance from the area. Besides the brief notes, Annual reports and the scientific publications issued from the Section, a list of insects of medical interest was submitted to the Medical Zoologist at his request.

The medical Entomologist also visited the area in March, to inspect the breeding places of *Anopheles gambiae* around Khashm el Girba. He visited several places viz., Halfajadeeda, El Shajarab, El Shuak, Jebel Meigel, Asubri, Musran and Kubri el Butana. *A. gambiae* was found breeding in river pools in almost all these places, though the channels in the Halfa Jadeeda area were free from mosquito breeding, at the time of the visit.

Malaria in the Area :—

According to Ahmed Eff. Sulaiman, Research Assistant, detailed by the Medical Zoologist from the Stack Medical Research Laboratories, in February alone 70 out of 300 blood slides examined by him for Malaria parasite, were found positive, the predominant parasite being *Plasmodium falciparum*.

Now taking the above two facts into consideration, viz., (1) the maintenance of *gambia* breeding in the area even in the dry season and (2) the occurrence of 23 per cent parasite rate in the human blood, one can safely conclude that Malaria will be one of the future major problems of health in the area. The dam, which is under construction at present, is scheduled to reach completion in December, 1963, when water will be released in the Main Canal. The seepage pools from the Main canal and the network of irrigation channels, issuing from it will create ubiquitous breeding places for *A. gambiae* all over, which is capable of maintaining itself in the riverpools in the dry season. Add to this the new strains of *Plasmodium* coming with the labourers from surrounding areas in the country and across the border. Malaria, at present in a smouldering endemic form, among the labour camps and other communities, can fulminate into epidemics as soon as favourable conditions are provided. Care should, therefore, be exercised to keep *Anopheles* breeding at its lowest, by maintaining the canals in a most tidy condition, and strictly adopting other mosquito control measures, with eradication as the ultimate objective.

Sandflies:—

This year also a large number of sandflies was collected from several important places in the country, such as Jebelain, Rabak, Tindelti, Kosti, Shual, Mallaha, Tozi and Khashm el Girba. A portion of this collection has been identified (Please see Appendix B). The occurrence of *P. langeroni orientalis* in Tozi in the months of January and October is of interest, since it is one of the few suspected vectors of Kala-Azar and bites man readily. In all 9 species and 3 sub-species were recognized. It may be mentioned here that since Theodor's (1948 and 1958 classification under which the genus *Phlebotomus* was split up into two genera has not yet been universally accepted, in this report the old classification has been readopted viz., *Phlebotomus* has been treated as the only genus, and *Sergentomyia* as one of its Subgenera. The details of the breakdown into species and the sex ratios are given in the aforesaid Appendix. An account of the Laboratory tests performed are given below in connection with the Insecticides.

Simulium:—

At a meeting held last year at Stack Labs. presided over by Dr. Mansour Al Hasceb, Assit-Director, Research, and attended by Drs. N. H. Satti, Mohamed Sharif and the Medical Entomologist, it was decided that the bionomics and the seasonal incidence of *Simulium damnosum* be studied with a view to suggesting control measures of the pest by treating the river with an insecticide at a suitable time, and suitable place in the Northern Province around Abu Hamed.

Parties from the Section started visiting the area from May, 1962, onward.

The following table will give an idea of the incidence of *Simulium* in the area :—

Month					Eggs	<i>Simulium damnosum</i>		Adults
						Larvae	Pupae	
May	1962	..	..	..	Nil	Present	present	present
June	1962	..	..	..	”	Nil	Nil	”
July	1962	..	..	..	”	”	”	Nil
Aug.	1962	..	..	..	”	”	”	”
Sept.	1962	..	..	..	”	”	”	”
Oct.	1962	..	..	..	”	”	”	”
Nov.	1962	..	..	..	”	”	”	”
Dec.	1962	..	..	..	”	”	”	”
Jan.	1963	..	..	..	+++	+++	+++	+++

A stretch of about 40 miles north and south of Abu Hamed from Dagash to Abu Tain was inspected every month. The main idea was to note the first appearance of the eggs in the river and then if possible to know the lengths of larval and pupal life so that the interval between two treatments of the river could be established. But, as will be seen from the above table, the early stages never appeared until January and when they all appeared simultaneously, they did so abruptly that it was not possible to determine the larval life, etc. In fact such a study is a whole time job, which in view of the shortage of staff in the Section could not be taken as such.

However, certain tentative conclusions can be drawn from the above data. From the total absence of the early stages of the pest from May to January in the area, it appears that it remains in the adult stage during the off season and takes the first opportunity to multiply in enormous numbers as soon as the conditions are favourable for breeding and builds up populations very rapidly.

Control

Mr. Marr, a W.H.O. Entomologist has visited Sudan and is at present touring the country to get an idea about the *Simulium* problem throughout the country with special reference to the river blindness. The Medical Entomologist has put at his disposal the data collected from May, 1962, and had discussions with him on different aspects of the problem.

In Ghana and Nigeria this pest has been controlled by treating the river and rivulets with DDT to give a concentration of 0.1 ppm. But in view of the much heavier discharges of the Nile here and since the pest population is not an isolate, i.e. a localised one at least in the north, it will be a very expensive proposition to embark upon a programme of total eradication of the fly. The river discharge at its lowest at Abu Hamed in May is 669 cubic metres which will require a single dose of 400 lbs. per week for a period of at least 6 weeks.

Moreover, application of DDT in comparatively still waters will surely involve great risk for the fish fauna, which no country can afford. However, let us wait for Mr. Marr's detailed report on subject.

Simuliidae

The problem of the green *Nimitti* in Medani, Wadi Halfa and Khartoum has been one that has defied control measure adopted both against adults as well as the early stages. These measures were tried at Khartoum and Sennar. Though

there was observed no appreciable decrease in incidence in the years that followed, as a direct result of the treatment of the river at Soba in 1955 and Sennar in 1957, still it is observed that the nuisance has been on the decline during the last two years. This statement is more in the nature of a general impression and is based rather on the common observation than on any intensive scientific study of the problem. Most probably this is due to the natural periodical fluctuations in insect populations. However, a letter from my friend Dr. Marshall Laird, Chief, Environmental Biology, Division of Environmental Health, W.H.O., Geneva, concerning the possibility of the biological control of *Tanytarsus lewisi* with the help of a W.H.O., consultant, aroused in me the interest it deserved. The Ministry of Health had given approval to a W.H.O., proposal to send Dr. Wolfgang Wulker, of the Zoological Institute of the Albert Ludwigs University Freiburg, Western Germany, for about a month to study the natural worm parasites of the *Chironomid* at Khartoum and Medani. In my reply to Dr. Laird, I promised all the possible, technical help that this Section could offer, in the nature of Laboratory equipment technical assistance, working space and microscopes etc. Dr. Wulker arrived in Khartoum on the 28th. February, 1963, whom I met there and discussed the problem. He later on visited Medani and was with us for more than a week taking several bottom samples with Peterson dredge and the plankton samples with the tow-nets. He also visited Sennar for a couple of days for a similar type of work there. Although there are many practical difficulties in the execution of biological control based on Dr. Wulker's own experience, I think a brief account of his observations made in the black Forest Lake in Germany is worth while recording here or future reference particularly because his work is published in German Journals that are not easily available here.

Dr. Wulker experience in Germany

In Black Forest Lake in Germany Chironomids are naturally infested with Mermithid worms to such an extent that a whole population of the host is decimated due to this natural epizootic. The parasite belongs to an unknown species of the Genus *Paramermis* on the Chironomid *Tanytarsus gregarius*. The infective worm comprises the first instar which attacks all the instars of larval *Tanytarsus*, the pupae are found infested with a later stage of the worm. This worm which naturally occurs on the early stage of *Tanytarsus* can be reared in laboratory and released in large numbers to parasitise normal individuals of the insect. But there is a certain amount of specificity between the host and the parasite. It is not possible to parasitise *Chironomus*, for example, with the parasite found on *Tanytarsus* in nature.

Effects of parasitisation on the host

The early stages viz., the larvae and pupae of *Tanytarsus* remain unaffected. But in adults the following behavioristic changes are observed:—

The infested males swarm in isolation from the normal males, for instance in the vicinity of boats and in the shades of rocks etc. Their flight has been observed to be abnormal in the sense that they fly too from near the boat or the rock to the water and back from it, and thus release the last instar of the worm into the water.

MORPHOLOGICAL CHANGES

The most important effect of parasitisation is *intersexuality*.

Males The following changes were observed in the males:—

- (1) The antennae have lost their male character of business, and are transformed to like that of a female.
- (2) The long hairs on the tarsi of a normal male disappear.
- (3) The testes are greatly reduced but in a few of them the spermatozoa are detected.
- (4) It is presumed that they are rendered incapable of copulation.
- (5) The 8th. sternite in the parasitised male possesses an aperture similar to the female genital opening: thus it is changed to an intersex.

Females

The ovary in the infested female is considerably reduced and rendered totally functionless. In a few individuals an annual process resembling the male unpaired organ is developed.

Dr. Wulker's findings in the Sudan

As mentioned above Dr. Wulker took bottom samples as well as tow-net catches in Medani, at Sennar and at Khartoum using the plankton sampler provided by the Section. The Medical Entomologist and the Laboratory Attendants accompanied him to river while these sample were taken. It appears that *Tanytarsus* breeds at the bottom where there is mud and none in the sand.

PARASITISM

1. There are *Mermathid* worms as natural parasites of Chironomids 66 both in the larval stage and in adults, collected at Wad Medani and Khartoum. But the parasite rate is very low viz., 0.1 per cent. The effect of parasitism seems to be similar to that observed in Germany i.e. *Intersexuality* in adults, and behavioristic difference in the swarming habit. The parasitic worms belong predominantly to the female sex.

DIFFICULTIES IN CONTROL

In discussions with him, Dr. Wulker dwelt at some length on the difficulties involved in the biological control by parasitising. First of all, there exists considerable host parasite specificity; the parasite found in Germany could not be used in the Sudan. Further, there is a seasonal difference in the incidence of parasites in Germany and the Sudan. While the parasite in the Black Forest Lake occurs from May to October, in the Sudan the *Chironomid* season is from November to March. However, his detailed report is awaited with interest.

HATCHERY

A colony of *Aedes aegypti*, a susceptible strain from El Obeid that survived last year's fire is still being maintained in the hatchery for study.

Eggs of *Culex pipiens fatigans* collected from Port Sudan formed the basis of a colony that has been just started. Difficulty in feeding the adults on rabbit appears to be insurmountable.

MUSCIDAE

Due to the unusually heavy winter rains at Port Sudan this year, there was a very heavy incidence of house flies, which may have been one of the causes of the severe outbreak of infective hepatitis there. The Medical Entomologist, who visited Port Sudan in March, also inspected the breeding places of flies, particularly Deim Arab and other deims. The heaps of cow dung that are disposed of by the Health Department, are better burnt off. The public latrines that were choked were also responsible for the fly incidence besides the rotting cotton seeds. The latrines were found teaming with fly larvae.

Insecticides

The special kit for testing insecticides on *Phlebotomus* which is, in fact, an improvised form of the Busvine Nash Method has been in use in the laboratory for about a year now for determining the susceptibility levels of the fly to various Chlorinated hydrocarbons and the O.P. compounds. Since it is extremely difficult to run colonies of sandflies in the laboratory to yield daily in such large numbers as to enable tests, one has to depend on the daily catches. Hence the work is very slow. Besides, the want of a constant temperature chamber in the lab. presents many difficulties, such as, a very high control mortality. In the following LC50's for some of the insecticides are given:—

Insecticide		Species Tested	LC50
Chlorinated Hydrocarbon	(DDT	<i>P. papatasi</i>	0. 9%
	(Dieldrin	Do	0.32%
	(Toxaphene	Do	0. 8%
	(Chlordan	Do	0. 1%
	(		
Organophosphorus Compounds	(		
	(		
	(		
	(Delnav	Do	0.67%
	(Malation	Do	0. 2%
	(		
	(		

The exposure period for DDT and Dieldrin was one hour, while for others was half an hour.

100 per cent kills were obtained with very small dose of Dipterex, Rogor, endrin, and Lindane.

The work is still in progress, and a paper will be sent off for publication as soon as further data are available.

TRAINING

During the year training was given to several public Health Officers, Sanitary Overseers, and Mosquito men, besides Mumarideen, etc.

A demonstration with a brief lecture on the economic importance of the insects of medical interest was given by the Medical Entomologist to a class from the Wad Medani Secondary School at the request of Mr. Badie Saleeb, the Science Teacher that accompanied the class.

Similar demonstration was given to trainees from the School of Hygiene that visited the Section under the leadership of El Sayed Ahmed Ibraheem Idrees, Principal of the School.

W.H.O. OFFICIAL

Mr. Fadil H. Khattat, W.H.O Entomologist, was afforded the facilities to test adult *Anopheles pharoensis* for its suseptibility to insecticides in the laboratory.

Appendix "A"

DETAILS ABOUT MOSQUITOES IDENTIFIED DURING
THE YEAR 1962/63

No.	Date of Collection	Locality	Species	Remarks
1	1.2.1961	Khashm el Girba ..	<i>A. gambiae</i>	Larvae
2	10. 2.1962	Ajari Canal ..	"	"
3	8. 2.1962	Khashm el Girba ..	"	"
4	28. 6.1962	Hajr en Nar ..	<i>Aedes vittatus</i> <i>Aedimorphus</i> sp	Zeer Larvae
5	13. 6.1962	Fugara ..	<i>Culex</i>	"
6	4. 7.1962	Lano Farteet ..	<i>Aedes aegypti</i>	(L Zeer
7	7. 7.1962	Jebel Tafri ..	<i>Culex cinereus</i>	"
8	11. 7.1962	J. Kalsimo ..	<i>Aedes vittatus</i>	Rock holes
9	14. 7.1962	J. Tafri ..	<i>Culex cinereus</i>	Larvae zeer
10	6. 9.1962	Kadugli ..	<i>Aedes vittatus</i>	Rock holes
11	9. 9.1962	" ..	"	"
12	10. 9.1962	Mirta North ..	"	Larvae
13	15. 9.1962	Hajr el Teir ..	"	Rock holes
14	"	" ..	<i>Aedes aegypti</i> <i>Angambiae</i>	Zeer
15	18. 9.1962	Mirta North ..	<i>Aedes vittatus</i>	Rock holes
16	"	" ..	"	Larvae
17	22. 9.1962	J. Tafri ..	<i>Culex grahami</i>	Larvae mud holes
18	23. 9.1962	Kadugli ..	<i>C. decens</i>	Larvae rock holes
19	1.10.1962	El Kawaweem ..	<i>An. rufipes</i> <i>C. univittatus</i>	mud hole
20	2.10.1962	Nuba ..	<i>Ae. univittatus</i>	
21	3.10.1962	Ayoko ..	<i>Ae. aegypti</i>	zeer
22	7.10.1962	Hajreleer ..	<i>C. decens</i>	rock holes
23	8.10.1962	El Mundab ..	<i>Ae. vittatus</i>	"
24	9.10.1962	K. el Girba ..	<i>A. gambiae</i> <i>A. pharoensis</i> <i>A. coustani</i> var <i>ziemanni</i> <i>C. pipiens fati</i>	Larvae
25	10.10.1962	K. el Girba ..	<i>A. gambiae</i> <i>Mansonia</i> (<i>Mansonioides afrecanus</i>)	
26	12.10.1962	Kadugli ..	<i>C. tigripes</i>	rock holes
	13.10.1962	Do. ..	<i>C. univittatus</i>	
27	14.10.1962	Hajrel Mak ..	<i>A. coustani</i>	"
28	17.10.1962	Hajre Teer ..	<i>Ae. vittatus</i>	"
29	18.10.1962	El Boro ..	<i>A. gambiae</i>	mud hole
30	20.10.1962	Muta North ..	<i>Ae. vittatus</i>	Larvae
31	22.10.1962	Um Maba ..	<i>C. nebulosus</i>	
32	29.10.1962	Mucta South ..	<i>A. gambiae</i>	mud hole
33	29.10.1962	Hila Mirta ..	<i>C. ethiopicus</i>	
34		Jebel Kleotray ..	<i>Ae. vittatus</i>	
35	23.11.1962	Halfa Jadeeda ..	<i>A. gambiae</i>	Larvae
36	24.11.1962	Khashm el Girba ..	(<i>A. gambiae</i> <i>C. pipiens fatigans</i>)	River pools
37	25.11.1962	El Makatta ..	<i>A. gambiae</i>	"
38	5. 1.1963	El Shajaral ..	<i>A. gambiae</i>	Larvae
39	Do	El Mereibia ..	<i>A. gambiae</i>	"
40	6. 1.1963	Khashm el Girba ..	<i>A. gambiae</i>	River pool
41	Do.	Kubri-el Butana ..	"	"
42	15. 3.1963	El Shajaral ..	"	"

No.	Date of Collection	Locality	Species	Remarks
43	25. 3.1962	Tandana	<i>Aedes aegypti</i>	Larvae
44	Do.	Kortala	"	"
45	Do.	Kurmuti	"	"
46	Do.	Dibatna	"	"
47	Do.	El Atshana	"	"
48	Do.	El Fasu	"	"
49	Do.	Er Rashad	one adult	one adult
50	Do.	Katoir	"	Larvae
51	Do.	Tanagala	"	"
52	25. 3.1963	El Nile	<i>Aedes aegypti</i>	Larvae
53	Do.	El Kadaro	"	"
54	Do.	Kalogi	"	"
55	Do.	El Kuroro	"	"
56	Do.	Salara	"	"

Appendix " B "

Date of Collection	Locality	Species	m f	TOTAL	Remarks
December, 1962	Jebelein	<i>Phlebotomus antennatus</i>	39—34	73	
"		<i>P. echristophersi</i>	0—1	1	
"	Tozi	<i>P. langeroni orientalis</i>	2—1	3	
October, 1962	"	<i>P. antennatus</i>	53—191	244	
"	"	<i>P. africanus</i>	60—219	2793	The old classification is re adopted here
"	"	<i>P. bedfordi</i>	1—2		
"	"	<i>P. papatasii</i>	1—0	1	
"	K. el Girba	<i>P. antennatus</i>	11—41	52	
January, 1963	"	<i>P. africanus</i>	15—15	30	
"	"	<i>P. clydei</i>			
"	"	<i>latiterga</i>	21—26	47	
"	"	<i>P. squamipleuris</i>	8—4	12	
"	"	<i>P. scdwetzi</i>	1—1	2	
"	"	<i>P. paptasii</i>	1—1	2	
December, 1962	El Eilafon	<i>P. papatasii</i>	1—0	1	
"	"	<i>P. antennatus</i>	15—42	57	
"	"	<i>P. clydei latiterga</i>	5—3	8	

CHEMICAL LABORATORIES

by

Abdel Hamid Ibrahim

ADMINISTRATIVE REPORT

1. Staff

(i) The staff position on 30th. June, 1963 was as follows:—

GOVERNMENT ANALYST

Abdel Hamid Ibrahim Suliman, D.G.M.C., B.Sc. (LONDON), M.Sc. (LONDON), D.I.C.

DEPUTY GOVERNMENT ANALYST

Rifaat Butrous Salama, B.Sc. (ALEXANDRIA), M.Sc. (LONDON)
D.I.C.

SENIOR SCIENTIFIC OFFICER

(*Vacant*)

SCIENTIFIC OFFICERS

Riad Mansour.

Mubarak Ali Karrar, B.Sc. (KHARTOUM), B.Sc. (NOTTINGHAM)
M.Sc. (CARDIFF)

(*Vacant*)

ASSISTANT SCIENTIFIC OFFICERS

Joseph Zaki, B.Sc. (KHARTOUM).

Zuheir Abdel Razak Atabani, B.Sc., (KHARTOUM).

Abdel Wadood El Sayed Osman, B.Sc. (ALEXANDRIA).

Ahmed Mahgoub El Hindi, B.Sc. (KHARTOUM).

(*Vacant*)

SENIOR TECHNICAL ASSISTANTS

Abu Bakr Ahmed Akour.

Ahmed Abdalla Nagi.

Mahdi El Tayeb Haboura.

TECHNICAL ASSISTANTS

Hassan Ahmed Yassin.

Mahmoud Abdel Ghafour.

Ali Hag Ibrahim.

Khidir Hassan Babiker.

Mahmoud Mohamed Ibrahim

(Vacant)

(Vacant)

JUNIOR TECHNICAL ASSISTANTS

El Tahir Bedawi.

Fadul El Rayah

Twefig Salih Mohamed

CLERKS

Watt-Wyness Eliaba.

Isamil El Kamil El Sayed El Mekki.

Pio Akolong Chol.

LIBRARIAN

Faisal Mirghani El Hakeem.

- (ii) The Government Analyst spent two weeks in Yugoslavia on the invitation of the Yugoslav Government to visit various pharmaceutical factories and laboratories.
- (iii) The post of Senior Pharmaceutical Chemist still remains vacant.
- (iv) Scientific Officer Sayed Mubarak Ali Karrar returned from his Study Course abroad during the year and started to organise the Pharmaceutical Section.
- (v) Two graduates were appointed in two of the vacant posts of Assistant Scientific Officers.
- (vi) Technical Assistants Salah El Din Bedawi El Sawahli and Hashim Omer resigned during the year.
- (vii) Clerk Omran Hussein was transferred during the year and was replaced. A new post of a typist clerk was established and filled during the year.

1. General

- (i) The name of "Welcome" which the laboratories has held for 23 years has been transferred to the pharmaceutical section to avoid the misunderstanding about the status of this government establishment. These laboratories will henceforth be officially known as The Chemical Laboratories, Ministry of Health.
- (ii) Work has started in the foundations of the new buildings for the Medical Research Institute. Alterations and fittings in the new pharmaceutical section were completed during the year.
- (iii) A considerable number of valuable equipments and instruments were acquired during the year. A Land-Rover Vehicle was acquired, a Beitz forensic microscope, water cooling unit, flame photometer, polarimeter, refrigerator, and a good quantity of library, store and office equipment.
- (iv) About 120 books were acquired for the library. Subscription in 6 new periodicals and publications was also started.

ANALYTICAL REPORT :

Summary

The following Table shows the number of samples received in different categories during the last two years:—

	1962/63	1961/62
Waters and Sewages	328	470
Foods	611	368
Drugs and Pharmaceuticals	67	34
Clinical Specimens	277	123
Toxicological Specimens	97	147
Forensic Specimens	120	91
Edible Oils, Seeds and Oil Cakes	3,568	2,469
Damaged Materials	1,011	401
Miscellaneous	309	190
TOTAL	6,388	4,293

The above Table shows that there was a 50% increase in the number of samples examined over the previous year. This is a remarkable increase which has put a heavy load on the staff during the year:—

The following Table gives the number of samples submitted by the various Government Departments and others during the last two years:—

	1962/63	1961/62
Ministry of Health	1,114	745
Ministry of Agriculture	100	34
Ministry of Animal Resources	13	58
Ministry of Commerce, Industry and Supply	6	18
Ministry of Communications	25	36
Ministry of Works	40	20
Customs Department	75	30
Armed Forces	11	7
Sudan Police	80	69
Local Authorities	40	5
Khartoum University	6	20
Sudan Gezira Board	88	16
Other Government Establishments	20	21
Commercial Firms and Others	4,770	3,214
TOTAL	6,388	4,293

The above Table indicates that the increase is mainly in samples submitted by commercial firms. Samples from the Ministry of Health showed a marked increase after remaining constant over the past three years.

The above Table also shows that nearly 75% of the samples received are from non-Government establishments.

The following Table shows the fees charged for analytical work during the last two years :—

	1962/63	1961/62
	LS. m/ms.	LS. m/ms.
Non-Government Establishments	10,820.849	5,525.191
Government Departments	1,590.775	2,410.237

As a result of the increase of their samples, fees from the Commercial Firms nearly doubled. The increase is however partly due to the increase in analytical charges. Fees from Government Deaprtments other than the Ministry of Health showed a marked decrease.

2. Water and Sewage :—

Samples of Waters and Sewages were received from the following sources :—

	1962/63	1961/62
Ministry of Health	109	171
Drilling Engineer	60	151
Sudan Gezira Board	38	13
Other Sources	121	135
TOTAL	328	470

The samples in this category are mainly water samples for fitness for human consumption from the chemical point of view. As expected samples of this category decreased with the decrease in the activities of the Land Use and Rural Water Development Deaprtment. But unexpectly also the public health authorities decreased their sampling activities.

3. Foods

The following samples were received during the year :—

	1962/63	1961/62
Official Samples	486	255
Other Samples	125	113
TOTAL	611	368

There is a marked increase in this category mainly from public health authorities.-

The following Table gives a summary of the different varieties of foods examined :—

DESCRIPTION								Number of Samples
Alcoholic Drinks	..	..	..	..	..	..	..	129
Beans	..	..	..	..	..	..	..	16
Beetroots	..	..	..	..	..	..	..	48
Cereals and Cereal Products	.	..	..	..	..	..	..	20
Cheese	..	..	..	..	..	..	..	10
Flour, Durra	..	..	..	..	..	..	..	4
Flour, Wheat	..	..	..	..	..	..	..	93
Fruits, Canned	..	..	..	..	..	..	..	9
Honey and Syrup	..	..	..	..	..	..	..	8
Meat and Meat Products	..	..	..	..	..	..	..	8
Milk, Raw	..	..	..	..	..	..	..	71
Milk, Dried	..	..	..	..	..	..	..	5
Rice	..	..	..	..	..	..	..	2
Sardines	..	..	..	..	..	..	..	5
Squashes	..	..	..	..	..	..	..	15
Sugar, Refined	..	..	..	..	..	..	..	26
Tomato, Puree and Sauce	..	..	..	..	..	..	..	83
Other Foods	..	..	..	..	..	..	..	59
TOTAL								611

The main items examined were alcoholic drinks, wheat flour, tomato puree and raw milk. All such foods are usually examined for quality and fitness for human consumption.

4. Drugs and Pharmaceutical

There is an increase in sample of this category mainly from the Chief of Division Medical Supplies. The Pharmaceutical Section has not yet started to function and hence only a limited number of such samples could be examined at the moment.

5. Clinical Specimens

The samples in this category show a continuous increase one year after another. This trend will continue till the hospitals and Stack Laboratories provide adequate facilities for all biochemical analysis.

6. Toxicologica and Forensic Specimens

There is a slight decrease in samples in this category . The increase in samples in this category depends on the expansion of police activities and the development of serious crimes.

7. Edible Oils Seeds and Oil Cakes

The following samples were submitted for analysis during the year :—

									Number of Samples	
									1962/63	1961/62
Cottonseeds	..	..	..	..	..	..	..	..	119	61
Groundnut Kernels	..	..	..	..	..	..	..	..	3,178	2,152
Sesameseeds	..	..	..	..	..	..	..	..	64	66
Castro seeds	..	..	..	..	..	..	..	..	16	7
Edible Oils	..	..	..	..	..	..	..	..	63	84
Oil Cakes	..	..	..	..	..	..	..	..	128	99
TOTAL									3,568	2,469

The great increase in samples in this category is mainly due to samples of Groundnut kernels as a result of the good crop the country had this year.

8. Damaged Materials

There is a marked increase in this category which is connected usually with the import insurance business.

9. Miscellaneous Samples

The following table gives details of the various types of samples received in this category :—

									1962/63	1961/62
Cigarettes	..	..	..	..	..	..	..	..	11	10
Gums	..	..	..	..	..	..	..	..	9	16
Fertilisers	..	..	..	..	..	..	..	..	15	—
Minerals	..	..	..	..	..	..	..	..	1	8
Paints, Varnishes and Polishes	..	..	..	..	..	..	..	..	3	2
Pesticides	..	..	..	..	..	..	..	..	15	13
Soap	..	..	..	..	..	..	..	..	32	20
Textiles	..	..	..	..	..	..	..	..	83	21
Miscellaneous	..	..	..	..	..	..	..	..	140	100
TOTAL									309	190

This category is mainly received from Government and semi-government departments for quality control and classification.

RESEARCH AND PUBLICATIONS

It is evident from the marked increase of samples year after year that the staff of the Laboratories are overwhelmed with routine. This year has shown yet another 50% increase in routine work which has caused all research activities to stop. Nevertheless, several surveys were made with respect to the alcoholic drink industry and Government purchases. In the field of legislation the laboratories prepared the ground for many amendments, Acts and Regulations.,

Moreover the routine monthly analysis of river and main waters at Khartoum continued.

The Annual Report for the year 1961/62 was published during the year.

CHAPTER IX
SCHOOL OF HYGIENE
ANNUAL REPORT-1962/63

The School buildings lie next doors to the Graphic Health Museum which is supervised by the Principal School of Hygiene.

The Museum is used by the students for demonstration and visual studies.

Staff

Principal.

Assistant Principal.

Public Health Officer

Clerk.

Board of Studies

The Board of studies which consists of the Assistant Under Secretary (Preventive) as Chairman, Principal School of Hygiene as Secretary, Chief Public Health Inspector and Assistant Principal School of Hygiene as members has held four meetings during the year to discuss the different aspects of the School policy.

Board of Examiners

The Royal Society of Health examination which is held in Khartoum, is conducted by Dr. Mohamed Rashad Farid, Dr. Mansour Ali Hasseeb, Sayed Abde-Rahman El Agib and Sayed Khalafalla Babiker with the Principal School of Hygiene in attendance.

Sanitary Overseers

On selection and when required the candidates receive a six months training in the School of Hygiene, which includes an adequate number of demonstrations to supplement lectures. 15 have conducted their training during the year.

Public Health Officers

The basic education now required is that of the secondary standard.

The students take up 3 years course at the end of which they must pass the R.S.H. examination before being awarded the qualifying certificate.

20 students were taken this year 1962/1963.

The Curriculum is Briefly as Follows

1st. Year

General Science, Building Science, Drawing and Construction, Levelling and Geometry. Given at Khartoum Technical Institute.

2nd Year

Entomology and Pests Control, Heminthology, protozoology, Bacteriology, Water Supply and disposal of Waste Matter.

3rd. Year

Food and Food Control, Meat Inspection, Milk food Production and Manufacture, Housing, Urban and Rural Planning Communicable Diseases, School Health, Prison Health, Quarantines, Airports and Seaports, Central Statistics, Sanitary Law, Relations between councils and public health staff, Notes on training within industries, Health Education

The necessary demonstrations that supplement the lectures include visits to Water Works, Food Production Places, Schools, Prisons, and Factories, etc. Certain councils meetings are also attended. In addition to the demonstrations and practical training in Khartoum Province and its rural areas, each student spends, part of his school vacation in another province besides Khartoum.

The School of Hygiene gives courses to Assistant Sanitary Overseers, Local Government Executive Officers, Health Visitors, Nursing and Medical Assistants Nursing College, Nursing Intermediate training School

3 Sanitary Overseers from Yeman have their training during the year

Building of hostel is progressing, and the school building approved, but not yet started.

Graphic Health Museum demolished and students missed an important demonstrating centre.

Visitors

H.E. The Minister of Health of Somalia visited the School on 17.10.1962.

Dr. E. Ferber Nutrition Expert F.A.O. visited the School on 24.11.1962.

Dr. S. Renjifo visited the school on 8.12.1962

H.E. The Minister of Health — Dr. Ahmed Ali Zaki visited the school on 10.1.1963 in his tour to the Ministry of Health branches in Khartoum.

Four delegates appointed by UNESCO in educational fields visited the school on 12.2.1963.

CHAPTER X

THE GRAPHIC MUSEUM

The Graphic Health Museum has been closed since its demolition in February, 1962. The new building is going on, and expected to be completed on 17th November, 1964.

CHAPTER X II

The following Table shows the mean rainfall recorded in provincial meteorological stations :—

PROVINCE	No. of Stations	Mean Rainfall mms.	Highest Recorded Rainfall mms.	Lowest Recorded Rainfall mms.
Bahr El Ghazal	10	1119	1538	798
Blue Nile	22	495	1221	229
Darfur	13	541	835	158
Equatoria	23	1480	2090	797
Kassala	19	305	705	65
Khartoum	7	208	253	182
Kordofan	16	557	815	137
Northern	10	60	184	7
Upper Nile	15	912	1451	502

TABLE I—1962/63
OUT-PATIENTS
NEW CASES BY DISEASES AND TOTAL ATTENDANCES

No.	DISEASE NAME	Bahr El Ghazal	Blue Nile	Darfur	Equatoria	Kassala	Khartoum	Kordofan	Northern	Upper Nile	TOTAL	No.
1	Cholera	—	—	—	—	—	—	—	—	—	—	1
2	Plague	—	—	—	—	—	—	—	—	—	—	2
3	Small Pox	—	95	—	—	—	—	—	—	—	95	3
4	Typhus	—	—	—	—	—	—	—	—	—	—	4
5	Yellow Fever	—	—	—	—	—	—	—	—	—	—	5
6	T.B. Pulmonary	591	1,267	324	364	1,253	1,493	690	636	1,848	8,466	6
7	T.B. None Pulmonary	608	910	198	261	1,090	1,117	404	173	2,163	6,924	7
8	Pneumonia	3,958	51,758	6,199	12,637	4,742	32,155	13,893	16,779	8,135	150,256	8
9	Influenza	198	7,144	4,673	4,768	8,879	38,052	10,877	6,384	1,058	82,033	9
10	Other Respiratory Diseases	51,139	990,874	248,499	248,487	339,704	592,206	367,359	338,658	83,773	3,260,699	01
11	Cerebro-Spinal Meningitis	99	385	517	223	87	61	114	5	68	1,559	11
12	Chicken Pox	678	2,525	646	5,026	1,428	6,370	2,165	1,121	1,839	21,798	12
13	Diphtheria	2	193	19	11	62	127	103	138	3	658	13
14	Encephalitis Lethargica	—	—	—	1	3	12	—	—	—	16	14
15	Measles	821	16,491	1,114	8,776	2,747	13,558	6,120	5,808	4,816	60,251	15
16	Mumps	401	18,148	1,548	3,815	8,003	7,870	4,547	5,314	2,934	52,580	16
17	Poliomyelitis, Acute	1	23	—	6	11	179	18	5	—	243	17
18	Rheumatism, Acute	12,301	14,338	3,176	10,215	4,294	18,464	15,398	16,505	11,312	106,003	18
19	Whooping Cough	62	7,464	387	2,377	2,069	5,694	1,841	3,101	2,695	25,690	19
20	Dysentery	5,871	67,838	12,453	20,160	10,316	77,337	22,047	41,243	20,899	278,164	20
21	Enteric Fever	—	414	—	7	56	459	9	112	87	1,144	21
22	Gastro-enteritis of Children	2,690	109,499	9,356	5,591	15,195	86,147	19,290	31,432	7,262	286,462	22
23	Undulant Fever	—	20	—	1	3	1	1	—	—	26	23
24	Filariasis	99	24	6	4,445	16	7	75	1	32	4,705	24
25	Leishmaniasis	2	1,132	5	156	426	32	178	—	555	2,486	25
26	Malaria	34,832	67,744	96,748	239,889	76,379	27,876	94,164	13,126	133,252	784,010	26
27	Black Water Fever	1	—	—	—	—	—	—	—	—	1	27
28	Onchocerciasis	2,329	—	—	1,923	—	1	—	49	—	4,302	28
29	Phlebotomas Fever	—	2	—	—	2	—	—	—	—	4	29
30	Relapsing Fever	—	—	—	—	—	—	—	—	—	—	30
31	Trypanosomiasis	—	—	—	41	—	—	—	—	—	41	31
32	Ancylostomiasis	3,348	30	251	7,175	52	27	60	61	170	11,174	32

No.	DISEASE NAME	B-EL GHAZAL	BLUE NILE	DARFUR	EQUATORIA	KASSALA	KHARTOUM	KORDOFAN	NORTHERN	UPPER NILE	TOTAL	No.
33	Dracontiasis	727	108	6	1,824	48	102	91	196	850	3,952	33
34	Schistosomiasis	803	22,256	11,533	3,770	751	6,004	5,744	4,674	392	55,927	34
35	Gonorrhoea	7,758	9,606	24,570	16,725	5,832	26,818	17,376	553	8,290	117,528	35
36	Soft Sore	48	93	1,164	301	618	1,267	144	1	156	3,792	36
37	Syphilis	6,802	7,643	38,546	10,379	5,309	13,780	25,967	4,341	12,018	124,785	37
38	Yaws	549	6	2	17,190	—	2	—	—	7,411	25,160	38
39	Anthrax	—	3	—	—	56	—	—	—	—	59	39
40	Hydrophobia, Human ..	2	5	14	—	1	2	13	—	—	37	40
41	Leprosy	512	185	22	870	17	207	237	17	28	2,095	41
42	Madura Disease	—	553	5	1	68	364	40	75	27	1,133	42
43	Tetanus	41	131	27	40	11	10	31	11	22	324	43
44	Heat Stroke Syndrome ..	—	—	—	—	17	1	1	—	—	19	44
45	Confinements	365	1,919	360	902	817	2,088	771	181	584	7,987	45
46	Gynaecological	1,380	40,261	9,469	3,822	8,269	41,058	42,724	14,431	1,789	163,203	46
47	Diseases of Pregnancy and Parturition	812	10,683	1,828	3,175	985	18,452	21,082	2,484	—	59,501	47
48	Puerperal Fever	84	94	588	10	120	145	53	473	—	1,567	48
49	Wounds and Injuries	77,690	838,681	221,935	311,813	262,699	535,610	331,083	234,308	78,541	2,892,360	49
50	Tropical Ulcer	4,480	1,465	4,168	17,956	1,597	8,449	2,337	3	2,584	43,039	50
51	Diabetes	7	659	181	311	534	4,387	676	1,130	—	7,885	51
52	Pellagra	—	15	16	—	—	4	32	—	28	95	52
53	Scurvy	36	1,811	135	479	577	18	2768	2	148	5,974	53
54	Neoplasms, Malignant ..	18	125	125	18	82	275	425	48	3	1,119	54
55	Neoplasms, Non-Malignant ..	30	18,596	152	61	364	1,102	5,469	491	1	26,266	55
56	Trachoma	85	64,980	14,051	1,746	7,061	65,328	8,376	127,268	5,700	294,595	56
57	All Other Eye Diseases ..	14,762	764,358	117,993	99,123	178,777	334,541	242,762	230,776	52,458	2,035,550	57
58	Ear Diseases	9,468	158,534	33,436	29,121	48,743	82,028	45,208	72,746	17,488	496,772	58
59	Skin Diseases	29,034	108,915	39,186	107,292	27,429	80,242	43,645	29,160	32,326	496,229	59
60	Alimentary Diseases	55,149	1,236,140	322,630	245,721	366,157	561,034	438,435	358,622	106,876	3,690,764	60
61	Circulatory Diseases	2,486	180,715	11,969	4,428	29,071	81,951	33,156	69,295	7,711	420,782	61
62	Genito-Urinary Diseases ..	5,439	179,314	52,561	16,958	29,914	135,501	66,548	97,574	12,338	596,147	62
63	Organic Nervous Diseases ..	10	8,799	2,775	48	3,472	6,016	11,050	42,072	—	74,242	63
64	Functional Nervous Diseases ..	66	11,085	62	26	198	3,302	529	62	95	15,425	64
65	Fever of uncertain Origin ..	41,776	32,018	29,953	31,597	4,191	289,896	178	52,049	45,682	527,340	65
66	All Other Conditions	60,204	918,445	148,946	199,486	221,660	599,525	246,552	149,031	66,211	2,610,060	66
67	Poisoning	—	345	—	—	371	333	—	1,047	630	2,726	67
68	Infectious Hepatitis	—	139	—	—	1,732	569	—	—	—	2,440	68
TOTAL NEW CASES.. ..		440,654	5,977,003	1,474,527	1,701,548	1,684,365	3,809,656	2,152,856	1,973,772	653,288	19,957,669	
ATTENDANCES : Men		553,617	3,049,250	836,499	1,242,544	902,484	2,671,524	1,357,947	682,781	591,077	11,887,723	
Women		364,856	2,895,708	649,663	799,416	700,081	2,078,218	1,163,229	885,996	378,239	9,915,406	
Children		357,596	3,771,246	813,588	1,102,070	1,188,707	2,064,756	1,249,948	809,596	536,565	11,894,072	
TOTAL ATTENDANCES		1,276,069	9,716,204	2,299,750	3,144,030	2,791,272	6,814,498	3,771,124	2,378,373	1,505,881	33,697,201	
Mission Out-patients Included Above ..							5536					
Mission Attendances Included Above ..							54344					

TABLE II—1962/63

ADMISSIONS AND DEATHS BY DISEASES

No.	D I S E A S E	BAHR EL GHAZAL		BLUE BILE		DARFUR		EQUATORIA		KASSALA		KHARTOUM		KORDOFAN		NORTHERN		UPPER NILE		TOTAL		No.
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
1	Cholera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
2	Plague	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
3	Small Pox	—	—	95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	95	—	3
4	Typhus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
5	Yellow Fever ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5
6	T.B. Pulmonary ..	245	30	1041	64	182	23	224	15	695	34	820	127	628	62	247	22	294	26	4376	403	6
7	T.B. Non-Pulmonary ..	123	4	226	5	61	1	60	3	316	4	209	10	189	18	85	1	256	17	1525	63	7
8	Pneumonia	467	37	1136	77	1050	21	1972	88	1018	60	1875	81	1909	91	603	39	617	34	10647	528	8
9	Influenza	195	—	68	—	212	—	251	5	113	—	975	16	20	—	146	—	9	1	1989	22	9
10	Other Respiratory Diseases	352	21	1818	36	533	9	682	19	1329	16	1106	11	2156	42	1434	14	414	9	9824	177	10
11	Cerebro-Spinal Meningitis ..	99	14	291	27	517	29	223	35	87	12	57	6	112	13	2	1	34	—	1422	137	11
12	Chicken Pox	678	2	155	—	31	—	637	1	176	—	29	—	542	—	105	2	165	10	2518	15	12
13	Diphtheria	2	—	167	9	19	4	11	1	54	5	90	4	72	11	119	10	9	2	543	46	13
14	Encephalitis Lethargica ..	—	—	—	—	—	—	1	—	—	—	12	1	—	—	—	—	—	—	13	1	14
15	Measles	821	—	511	3	116	—	918	16	307	2	390	8	541	1	111	6	490	11	4205	47	15
16	Mumps	401	—	155	—	437	—	115	2	99	—	32	—	62	—	64	1	57	1	1422	4	16
17	Poliomyelitis, Acute ..	1	—	21	2	—	—	6	—	11	—	57	2	18	—	4	—	—	—	118	4	17
18	Rheumatism, Acute ..	129	4	401	2	64	—	175	2	203	—	114	—	398	—	194	1	156	2	1834	11	18
19	Whooping Cough	62	1	167	5	16	—	60	2	67	4	193	3	26	—	67	1	90	6	748	22	19
20	Dysentery	174	12	833	29	384	16	605	44	727	22	1125	35	638	23	534	2	471	26	5491	209	20
21	Enteric Fever	—	—	422	4	—	—	7	—	56	2	458	8	7	1	107	3	84	7	1141	25	21
22	Gastro-enteritis of children ..	85	6	2043	199	272	57	288	40	837	100	2172	131	521	54	1225	87	248	25	7691	699	22
23	Undulant Fever	—	—	21	—	—	—	1	—	3	—	1	—	1	—	52	—	—	—	79	—	23
24	Filariasis	6	—	6	—	6	—	34	—	16	—	—	—	—	—	—	—	7	—	77	—	24
25	Leishmaniasis	1	—	319	20	1	—	145	10	426	38	32	4	171	6	—	—	312	5	1407	83	25
26	Malaria	783	68	1408	25	909	28	2736	80	893	1	543	3	4411	142	764	13	436	15	12883	375	26
27	Black Water Fever	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	27
28	Onchocerciasis	35	—	—	—	—	—	22	—	—	—	—	—	—	—	—	—	—	—	58	—	28
29	Phlebotomus Fever	—	—	2	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	3	—	29
30	Relapsing Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30
31	Trypanomiasis	—	—	—	—	—	—	42	3	—	—	—	—	—	—	—	—	—	—	42	3	31
32	Ancylostomiasis	118	10	3	—	37	—	380	5	22	1	27	—	7	—	3	—	7	—	604	16	32
33	Dracontiasis	7	—	8	—	1	—	80	—	19	—	3	—	11	—	—	—	—	—	129	—	33
34	Schistosomiasis	69	1	460	11	60	1	221	5	62	1	407	—	75	4	105	1	57	—	1516	24	34
35	Gonorrhoea	36	—	24	—	104	—	269	—	11	—	5	—	11	—	6	—	41	1	507	1	35
36	Soft Sore	—	—	4	—	—	—	8	—	2	—	—	—	—	—	1	—	23	—	50	—	36
37	Syphilis	47	—	21	1	395	2	263	1	25	1	28	1	158	—	26	—	279	—	1242	6	37
38	Yaws	3	—	—	—	—	—	236	1	—	—	—	—	—	—	—	—	44	1	283	2	38
39	Anthrax	—	—	3	—	—	—	—	—	22	—	—	—	—	—	—	—	—	—	25	—	39
40	Hydrophobia Human ..	2	2	5	5	11	11	—	—	1	1	2	—	13	12	—	—	—	—	34	31	40
41	Leprosy	—	—	16	—	—	—	1	—	15	—	16	—	2	—	9	—	29	2	88	2	41
42	Madura Disease	—	—	217	1	5	—	—	—	68	1	106	—	11	—	77	—	6	—	490	2	42
43	Tetanus	41	11	121	21	27	9	29	18	9	2	10	2	31	13	11	4	31	7	310	87	43

No.	Disease	BAHR EL GHAZAL		BLUE NILE		DARFUR		EQUATORIA		KASSALA		KHARTOUM		KORDOFAN		NORTHERN		UPPER NILE		TOTAL		No.
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
44	Heat Stroke Syndrome ..	—	—	—	—	—	—	—	—	16	—	1	—	—	—	—	—	—	—	17	—	44
45	Confinements	217	13	1,296	10	360	12	755	7	789	4	2,088	2	771	21	447	8	178	4	6,901	81	45
46	Gynaecological	167	5	3,306	13	860	12	223	1	1,674	10	2,246	2	2,145	7	1,318	12	181	—	12,120	62	46
47	Diseases of Pregnancy and Parturition	65	—	1,004	11	41	—	201	1	578	1	2,021	3	420	3	273	2	—	—	4,603	21	47
48	Puerperal Fever	3	—	43	2	32	2	9	—	110	4	138	7	29	—	408	2	—	—	772	17	48
49	Wounds and Injuries ..	2,104	46	6,903	131	2,893	46	4,375	45	5,089	46	4,062	84	3,532	105	2,436	49	1,276	17	32,670	569	49
50	Tropical Ulcer	216	5	15	—	87	—	1,071	4	8	—	2	—	55	—	—	—	242	2	1,696	11	50
51	Diabetes	13	1	192	8	23	1	9	—	141	4	704	37	24	1	159	1	—	—	1,265	53	51
52	Pellagra	—	—	15	—	—	—	—	—	—	—	2	—	1	—	—	—	—	—	18	—	52
53	Scurvy	—	—	2	—	1	—	11	3	14	—	6	—	2	1	2	—	6	—	44	4	53
54	Neoplasms, Malignant ..	11	3	49	3	33	7	17	3	74	16	266	62	180	10	48	1	139	—	817	105	54
55	Neoplasms, Non-Malignant	6	—	42	1	21	2	60	1	80	1	493	13	174	—	159	—	6	—	1,041	18	55
56	Trachoma	3	—	474	—	9	—	3	—	—	—	58	—	9	—	47	—	64	—	667	—	56
57	All Other Eye Diseases ..	69	—	343	—	217	—	429	1	547	—	1,440	1	252	—	577	—	413	—	4,787	2	57
58	Ear Diseases	5	—	50	1	36	—	65	—	37	—	48	—	48	—	120	1	21	—	430	2	58
59	Skin Diseases	68	—	207	1	125	—	387	3	88	—	213	2	146	—	323	1	123	1	1,680	8	59
60	Alimentary Diseases ..	811	59	3,811	202	986	138	1,901	106	2,506	103	4,384	120	3,787	167	2,958	75	973	40	22,117	1,010	60
61	Circulatory Diseases ..	140	19	1,385	130	517	36	546	51	814	74	1,649	173	507	21	905	40	114	7	6,577	551	61
62	Genito-Urinary Diseases ..	68	7	1,136	45	504	14	136	5	871	23	1,155	47	665	11	967	15	172	5	5,674	172	62
63	Organic Nervous Diseases ..	7	1	126	—	9	—	35	2	119	6	217	12	69	3	109	3	17	—	708	27	63
64	Functional Nervous Diseases	33	1	49	2	25	1	23	—	70	1	29	—	60	—	78	—	4	—	371	5	64
65	Fever of Uncertain Origin ..	573	28	2,495	138	380	7	145	8	759	31	911	29	112	4	618	10	207	3	6,200	258	65
66	All Other Conditions ..	2,110	127	2,098	28	1,529	35	2,089	47	467	10	2,977	23	4,042	37	922	20	1,025	55	17,259	382	66
67	Poisoning	—	—	56	6	—	—	—	—	76	—	333	30	—	—	55	3	—	—	520	39	67
68	Infectious Hepatitis ..	—	—	116	1	—	—	—	—	293	18	102	9	—	—	—	—	125	12	636	40	68
	TOTAL	11,672	538	37,901	1,279	14,150	524	23,192	684	22,909	659	36,441	1,109	29,772	884	19,031	451	9,952	354	205,020	6,482	
	MISSION IN-PATIENTS AND DEATHS INCLUDED ABOVE	—	—	—	—	—	—	—	—	—	—	1,460	87	—	—	—	—	—	—	—	—	

